Designing online social interaction for and with older people

A thesis submitted to Middlesex University in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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Abstract

This thesis describes my explorations and reflections regarding the design of online social interaction for and with older people. In 2008 when I started my doctoral investigation only a third of people over 65 years in the UK were using the Internet. This number has now increased to half of the population of 65-75 year-olds being connected to the Internet. From 2000 onwards EU wide directives increasingly encouraged research in the development of online technologies to manage the needs of an ageing population in the EU. Alongside health-related risks, the issue of social isolation is of particular interest to be tackled, considering there is a rapid development of new forms of communication and interaction media based on online technologies that could help in maintaining contact between people. A beneficial design strategy is to involve older people in the design process to ensure that technological developments are welcomed and actually used. However, engaging older people, who are not necessarily familiar with digital technologies, is not without challenges for the design researcher.

My research focuses both on design practice (the development of artefacts) and the design process for online social interaction involving older people. The thesis describes practice-led research, for which I built the Teletalker (TT) and Telewalker (TW) systems as prototypes for experimentation and design research interventions. The TT can be described as a simple TV like online audio-video presence system connecting two locations. The TW is based on the same concept has been built specifically for vulnerable older people living in a care home. The work described involves embodied real-world interventions with contemporary approaches to designing with people. In particular I explore the delicate nature of the researcher/participant relationship.

The research is reported as four sequential journeys. The first design journey started from a user-centred iterative design perspective and resulted in the construction of a wireframe for a website for older users. The second journey focused on building the TT and investigated its use in the real world by people with varied computer experience. The third journey involved designing the TW system specifically for elderly people in a care home. The fourth journey employed a co-design approach, with invited stakeholders, to reflect on the physical artefacts, discuss narratives of the previous design journeys and to co-create new online social technologies for the future.

In summary, my PhD thesis contributes to design theory by providing: a reflected rationale for the choices of design approaches, documented examples of design research for social interaction and a novel approach to research with older people (*the extended showroom*). It further offers insights into people's online social interaction and proposes guidelines for conducting empirical research with older and vulnerable older people.

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I would also like to thank my family, in particular my husband Simon, my daughter Hannah and my mother Ingeborg for being patient, understanding and throughout supportive in this learning journey.

This thesis is dedicated to my father
Heinz Günther Johannes Markowski

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Chapter 1

1 Introduction

In 2002 Ford launched a small car called Fusion aimed at families for flexible usage. However, against marketing expectations the car was more popular with the older generation rather than families. This was due to the car being easier to enter and exit because the seats were in a higher position, improving viewing from the driver's position, as well as is the car's overall practicality[1]. Conversely, there are also numerous examples where marketeers and designers have worked on products or services for older adults, which have been unsuccessful[2].

1.1 Background and Motivation

This story of the development of Ford's Fusion, resonated with my own experience: designing for older people was not straightforward and underexplored. By the time I started my PhD in 2008 (part time) I had eight years experience of working in 'usability'[3] for various companies, which included a mobile phone network provider and established user experience agencies with clients in retail, banking, technology, government and charities[4]. Having evaluated numerous effective and ineffective computer-based interfaces and systems and gathered a wealth of knowledge about users' behaviour in various contexts I developed the desire to design again, which I originally set out to do in my career. I wanted to design something 'useful' and 'beneficial' that also added to the pool of knowledge.

During my commercial work it became apparent that there was a lack of interest in user research with people over the age of 65 years. It seemed that most computer-based systems or services designed and tested were targeted at the educated 18-35 year olds. Some government and large retail systems were aimed at a wider population and age group, but overall it appeared that on reaching retirement age the 'older person' was seldom invited to take part in user research.

[1] I gained this knowledge in personal communication with Mike Bradley (who used to work for Ford Ergonomics UK before joining Middlesex in the department of Product Design) via email on 25.10.11.
[2] For example, Heyday an online subscription magazine had to close since its proposition of offering promotions and benefits on services and products for people nearing retirement age (readers with a minimum age of 50 years) was too general and they did not achieve sufficient subscriptions (Clews, 2009).
[3] Usability refers to making products and systems easier to use, and matching them more closely to user needs and requirements.
[4] The clients were companies such as Macmillan Cancer Research, Sainsbury, Barclays, BusinessLink, and T-Mobile.

In 2008, the hype evoked by Facebook was strong. Being a Facebook member since early 2007, I found myself sitting in front of the computer and sending status updates of how I felt on the day to the larger public. I started to wonder how many older people were using Facebook and if they were not, why not. Was there anything similar online that older people would use to stay connected with friends and the world?

I enquired informally with older people whom I knew, whether they used online social networking sites or forums and if not, what the reasons for the non-use were. This led me to receive an email from a person over 60 years old living in Australia. On 24 July 2008 he wrote:

> *"The only other experience I have is of my father. He moved out here to Australia from the UK in 1993 when my mother died. Around 1995 I was searching on the Internet for some Al Bowlly recordings for him and came across a couple of discussion groups dedicated to UK dance bands of the 30's and 40's. Dad, who was 83 at the time, joined these groups, with my help, and became a very active member for the next 6 years until he died. He was the oldest member of the group and was viewed as an authority as he had actually seen many of the bands they were discussing. My father was a gregarious person and was still active as a musician in the UK when he emigrated. In Australia he made a new circle of friends quickly, including a number of local musicians, (but no longer played himself - I think lugging his double-bass around was a daunting prospect at his age!) but he wasn't in regular contact with other musicians who had played in the 30's and 40's in the UK anymore. The discussion group allowed him to chat about those times with people who were genuinely interested in what he had to say and he got a lot of pleasure out of them." (Bruce, email communication, July 24, 2008)*

This inspirational account led me to the idea of wanting to design something that facilitates older peoples' online social interaction.

My initial research question started to form: how do I design online social interaction for older people?

This question guided the overall direction of my research, and provided the starting point for my PhD research.

1.2 My PHD design research process

As may be expected in design research, my research process was not linear. At the beginning, in 2008, I aimed to design an interface or system that facilitated online social interaction for older people. However, over time my emphasis changed. My research can be seen a series of *journeys as being* part of an overall journey, each

with a different focus, shifting from an outcome orientated perspective (designing for) to a collaborative process orientated one (designing with).

I chose to work with Constructive Design Research (CDR) because CDR is a flexible meta-methodological approach. It allowed me to work with multiple methods whilst being reflective of the framework and choices. CDR places emphasis on the **construction** of an artefact, experiment, media or space and to research with this (Koskinen, Zimmerman, Binder, Redström, & Wensveen, 2011). I provide a full account of CDR in the methodology Chapter 3.4.

Although CDR emphasises the construction of the artefact(s) it also embraces the design process and enables the sense making with others through the artefact(s). This resonates with my concerns for exploring ways of learning from, collaborating with and empowering older people. These considerations are key aspects of co-design – a design research methodology that I provide a definition for in section 1.5.

Only in reflection was I able to properly review what I had achieved and to draw out a structured narrative for this thesis. For this I divided my overall research journey into 3 time phases and plotted my design journeys onto it.

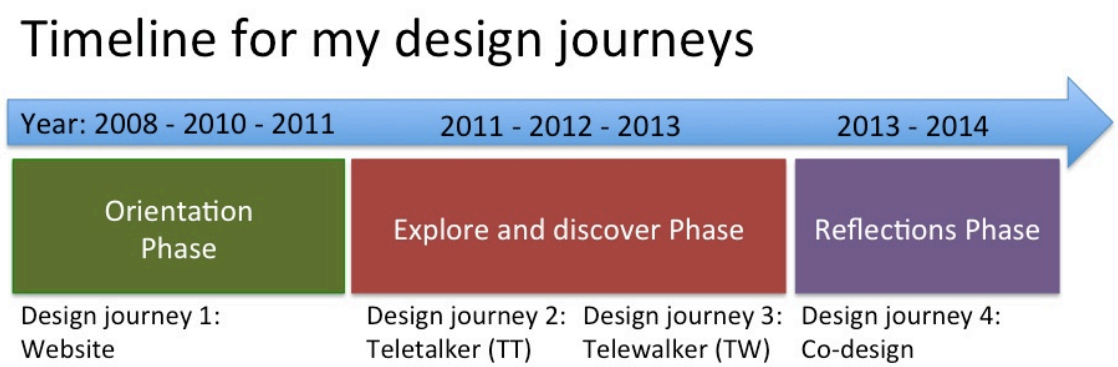


Figure 1: Timeline and phases for my PhD research journey

At first, there was the **Orientation Phase**, where an understanding of the scope and breadth of the topic and design challenge was gained. This phase can be compared with the analysis of the situation before moving into the next phase in creative problem solving (J. C. Jones, 1980; Koberg & Bagnall, 2003; Margolin, 1996). At that time I concentrated on computer literate older people only and was working on designs for a social media website. From 2010 to 2011 I was on maternity leave, which meant I had an extended period away from my studies. During this time I was able to internalize and reflect on my research so far. (I call this time according to Wallas's phases for creativity the *incubation period* (Wallas, 1927) see Chapter 5.4.)

After this period, I became interested in the role of face-to-face online communication for non-computer literate older people and I decided to re-frame the design space (Westerlund, 2009) accordingly. In 2011 I started to build my artefact, the *Teletalker* (TT), a simple TV like online audio-video presence system connecting two locations, and conducted interventions with it during 2012. Hence I label this phase the **Explore and discover phase** (2011-2013) (See Chapter 6 for the TT design journey). During this phase the opportunity arose to design the TT also for two London care homes. In order to cater for the specific audience's requirements, in this case for vulnerable and elderly people, I developed the *Telewalker* (TW), the sister product on wheels (See Chapter 7 for the TW design journey).

The last phase I label the **Reflections phase,** in which I conducted a co-design workshop with selected stakeholders. In this workshop I presented a narrative of my previous research journeys, alongside with the TT and TW prototypes, for participants to debate, reflect and develop further online video technology for social interaction addressing older people. This phase could also be understood as an evaluation phase, similarly to Jones' phases for design: analysis, synthesis and evaluation (Jones, 1980). But I preferred the term **reflections** since I saw this phase as a collaborative and open activity, which generated further suggestions, rather than a measuring activity as the term evaluation might suggest. (See Chapter 8 for the co-design journey)

During the time of my PhD research I saw my overall journey as one continuous design process, with only one change in framing the situation after the incubation period, and the TW as an offspring of the TT. However, after plotting the journeys along those phases it revealed to me that it would be more helpful to speak of 4 different design journeys in order to report on the insights that I gained.

In each of the phases and accompanying design journeys, there were mini cycles of learning based on active experimentation, concrete experience, reflective observation, abstract conceptualization (Kolb, 1984). These mini cycles occurred in parallel to the cyclic model for CDR and complemented each other.

As mentioned previously, these research journeys were guided by a central research question: **how do I design online social interaction for older and with people?**

In order to begin addressing this question, I introduce and justify definitions of the key terms: older people, online social interaction, design and co-design.

1.3 My definition of older people

There are inconsistencies in literature around which term to use when studying older people (Arch, 2003; Wagner, Hassanein, & Head, 2010). For example Caprani writes: “An elderly person is defined as someone who is ‘advanced in years’ typically 65 years and over” (Caprani, Dwyer, Harrison, & Brien, 2005, p.2070).

Literature indicates a differentiation between young old and older old people, although a specific starting age for the older old group cannot be established. Bailey suggests that older starts with 60-74 years and older old with 75+ years (Bailey, 2004). Other literature refers to the older old or oldest old from 80 or 85 years and older (P B Baltes, Staudinger, & Lindenberger, 1999; Czaja, 2003; Harwood, 2007; Poon, Jang, Reynolds, & McCarthy, 2005).

Providing a discussion on terminology Harwood points out that ‘geriatrics’ is related to medical health issues, ‘elders’ denotes a specific group of wise and trusted community leaders and ‘the elderly’ describes a very diverse group with a definite article. According to Harwood ‘seniors’ or ‘senior citizen’ are acceptable terms, albeit with a legal tone, and ‘older adults’ is the most appropriate way to refer to the heterogeneous group of older people (Harwood, 2007, p.44).

The Think Tank of the International longevity centre UK writes:

> *Mind our Language: The way we talk about age impacts how we conceive and design technology for older people. Politicians, policy makers and commentators should avoid using words like ‘old’ or ‘elderly’, which imply that age is a condition or a destination, and instead talk of ‘ageing’ and ‘older’. (Roberts, 2010)*

Taking those arguments into account I will refer to ‘older people’ throughout my thesis to signify the large group of older people.

For the purpose of my PhD research I define older people as 65 years old and above. This is in line with how the European commission defines older people in general (European Commission, 2012). I chose 65 years as the starting point for ‘being older’ as it usually signifies retirement age, however, I found that the physical age does not necessarily make a person feel old. For example, Brandt et al. use the expression “situated elderliness” in order to address older people (55 - 75 years old) in design activities (Brandt, Binder, Malmborg, & Sokoler, 2010). They found that their participants never seemed to perceive themselves as senior citizen or elderly. This is where I differentiate between active older people and vulnerable older people as discussed in Chapter 2.2.3.

I will be using the term ‘elderly’ when I write about the people who are at least 75 years old and who are living in care homes or with care provision at home. I discuss the question of who are older people in more detail in Chapter 2.2.

1.4 My definition of online social interaction

I define ‘online social interaction’ as happening in an environment where at least two people are connected through digital electronic means and can transfer data with the intention of wanting to interact with the other person in an understanding manner.

For the purpose of my research and the design outcome I am only interested in online social interaction, which serves the purpose of experiencing random acquaintanceship, setting up or intensifying friendship and companionship, and maintaining connectivity to family relations.

I explain how I arrived at this definition of online social interaction in Chapter 2.3.

1.5 My definition of ‘design’

The term ‘design’ is ambiguous, particularly in the English language compared to other languages where form-giving activities are labelled specifically[5]. Numerous authors provided literature on designing (Buxton, 2007; Cross, 2007, 2008; Lawson, 2005; Pugh, 1991), design principles (Keates & Clarkson, 2003; Lidwell, Holden, & Butler, 2003; D. Norman, 1998) and design research (Blessing & Chakrabarti, 2009; Frayling, 1993; Ken Friedman, 2000; Koskinen, Zimmerman, Binder, Redström, & Wensveen, 2011; Krippendorff, 2006; Simon, 1996; Simonsen & Robertson, 2013), each of them employing their view of the term “design” depending on the socio-cultural understanding at the time of publishing. I provide an overview of developments in the field of design research in Chapter 3.2.

Sara Hjelm distinguishes between 3 meanings of design (Hjelm, 2004, p.1):

1. Process: The design process as a construction and problem-solving process as Simon describes it (Simon, 1996)
2. Profession: The design practice, where decisions are made on the properties or shape of the artefact, in the field of *practical aesthetics* (Schoen, 1991)
3. Product: Design as product, which refers to the physical form of the artefact, which encapsulates the specific view of the designer (Attfield, 2000)

[5] For example, gestalten (to form) and entwerfen (to develop the idea on paper) in German.

As the title of my thesis suggests I concentrate foremost on the activity of ‘designing’ - in Hjelm’s categories on ‘design practice’ and ‘design process’ - rather than on the characteristics i.e. the physical design of an object or a service. At the same time the artefact plays an important role since it embeds the researchers’ knowledge and it can elicit reactions and meaning from other people.

There were several interesting discussions on the PhD design mailing list (“JISCMail - PHD-DESIGN Archives,” n.d.) of the origin and etymology of the word design. Does designing start with an idea in a person’s head? (See for example (Yagou, 2010)). There is an obvious difference between ‘everyday designing’ where we all take part in, such as choosing what and how to cook or how to display our CV and the ‘professional designing’, which is commonly associated with graphic design, product design, fashion, industrial design, interior design. Krippendorff provides a useful description of the etymology of the word ‘design’ and subsequently offers the definition: “design is making sense of things” (Krippendorff, 2005, p.xv). With his definition and main argument in the book he places emphasis on the design recipients’ perspectives and whether they can make sense of and understand the designed artefact.

Chakrabarti and Blessing, coming from an engineering design perspective (industrial design), use the term design to refer to all activities that generate and develop a product, product idea or technology, including full documentation of the process, as well as satisfying the perceived needs of the users and other stakeholder (Blessing & Chakrabarti, 2009). They further write *“design is not only a knowledge-intensive activity, but also purposeful, social and cognitive activity undertaken in a dynamic context aimed ‘at changing existing situation into preferred ones’”* (Blessing & Chakrabarti, 2009, quoting Simon, 1996).

Binder et al. offer a persuasive discussion on the object of design (Binder et al., 2012), which I have adopted in my understanding of the word ‘designing’. They propose that *“the object of design is to draw things together“ (Binder et al., 2012, p.21).* The 3 keywords are ‘draw’, ‘things’ and ‘together’. ‘Draw’ since a designer visualizes and frames a situation, not necessarily by ‘drawing’ but through other forms of expression and offers suggestions for the future. ‘Things’ are *“the socio-material assembly that deals with matter of concern”* imagined and proposed by the designer (Binder et al., 2012, p.26). ‘Together’ indicates the participative element of design, where the propositions of the designer can only be accepted, when the audience, recipients or people understand them.

Despite many variables in definitions for design, all point to the same common ground: Designers are concerned with exploring what might become i.e. translating the imaginary world into the real one.

For this designers use a different form of thinking to induction or deduction as common in scientific research. *Abduction* is a form of thinking that allows a person to deal simultaneously and iteratively with framing a situation and thinking of possible alternatives (Cross, 2007; Steen, 2013). This form of thinking is prominent with designers and is particularly useful for 'wicked problems' (Richard Buchanan, 1995; Rittel & Webber, 1973) where not one optimal, but many possible solutions are likely (Richard Buchanan, 1995; Cross, 2007; Melles, 2008b).

One major development in design research is the trend to address more societal challenges such as sustainability, healthy living and ageing societies (Backlund et al., 2006; Bowen et al., 2010; Evans, 2013; Romero et al., 2010). Many of these challenges are *wicked problems*. With this trend "the fuzzy front end" (E. Sanders & Stappers, 2012, p.21) in design research has increased, which implies that outcomes are even less likely to be predictable. In line with this trend, the term *co-design* has gained in prominence and popularity. A working definition of the term follows.

1.6 My definition of 'co-design'

In the literature, co-design can have nuanced meanings and values associated depending on the given research field. One overall definition is difficult to obtain. In most fields (e.g. HCI, interaction design, innovations studies, computer supported collaborative work) when the term co-design is employed, it implies a direct involvement by stakeholders and receivers of the designed proposition i.e. an engagement of non-designers during the design process. I employ the term 'stakeholder' in the widest sense; the concept behind a stakeholder is that the "values of certain people in some relation to the system could influence the system" (Albinsson, 2004, p.1). In industry, stakeholder involvement is usually associated with the client or the research commissioning institution.

Steen, from the innovation and co-design community, describes co-design as "processes of creative cooperation" (Steen, 2013). The participatory design (PD) community also embraced the term co-design to describe participatory design (Dearden et al., 2012; Geppert, 2014; Markussen, 1996). The origins of PD are routed in the western political and social movements of the 1960 and 70s based on

democratic and empowering values (Björgvinsson, Ehn, & Hillgren, 2010; Lundin, 2005). From PD's point of view designing is a political act and should adhere to underlying democratic principles (F. Kensing & Greenbaum, 2013).

Although I already consider designing as a social act (as Binder et al. see previous section), I define co-design to explicitly indicate the collaborative intent in design research particularly when addressing stakeholders, who are non-designers. I reflect on the level of design involvement by non-designers in my four design journeys, in Chapter 9.3 by employing Lee's model for design participation tactics as a lens (Lee, 2006). It highlights that the categories of collaboration (designing for) and emancipation (designing with) are not clear-cut.

The next section refers to the development of the research questions that were guiding my investigation. However, it needs to be noted that the choice of methodology and approaches and subsequent findings are not addressing the research questions in a linear fashion. It is part of design research (see Chapter 3.2) to stay reflective of research question and program or framework and possibly to re-frame the questions.

1.7 My Research questions

My main research question is: **how do I design online social interaction for and with older people?** My initial question was how do I design online social interaction for older people, but through the experiences collected I rephrased the question to say how do I design online social interaction *for and with* older people.

From this I developed sub-questions to guide my investigation.

I needed to understand more about older people and their behaviour. In particular I was interested in: **How do older people currently undertake online social interaction?** The literature review and my empirical research through interviews, survey, observations and design experiments as well as interventions contributed to answering this question (see Chapter 9.11.1).

Secondly, I wanted to understand what type of guidance there was, as well as what a designer needed to consider for when designing online technology for older people. Hence the question: **What are the design considerations when designing online technology for older people?** All four design journeys, but in particular the literature review, the making of the website wireframe as well as the making of the Teletalker and the Telewalker brought this question into focus (see Chapter 9.11.2).

Thirdly, I was wondering when new online technology was developed where older people would hear about it? Where could they try it out? Would they need particular skills or equipment to use the technology and why should they have it? Since there are many factors that play an important role for an older person to be interested in and adopt the latest online technology I kept my question suggestive with a ‘may’.

How may new online social interaction technologies be made suitable for adoption by older people?

All of my design journeys, and in particular in those situations where design propositions were brought to older people, contributed to answering this question. (see Chapter 9.11.3)

Finally, I was wondering whether there were ways of approaching empirical research with older people that were more suitable than others. The following question was formulated: **Which elements of a method make it suitable for researching new technology with older people?**

All four journeys are connected by the aim to explore the role of online connectivity for and with older people in regards to social interaction and involved the construction of artefacts. The shift from the first to the second journey brought out an epistemological difference. The first design journey started from a user-centred iterative design perspective and constructed a wireframe for a website for older users. But concentrating on the user left me unsatisfied in regards to addressing the group of older people who had no or very little experience with computers, which was the majority of older people in the UK from 65 years onwards.

The second journey focussed on building the artefact and conducting interventions in the real world with it by addressing people with and without computer skills. The third journey involved designing a system for elderly people in a care home. Considering this vulnerable user group, this approach meant close collaboration with the support team (in this case KIT volunteers and care home staff), which made this journey significantly different to first research journey. In order to have my design journeys and propositions reflected by the wider community I employed a co-design approach. Stakeholders were invited to reflect on the narratives of the previous design journeys and to co-create new online social technologies for the future.

In all four journeys a variety of methods for empirical research was applied and I reflected upon their use after each journey and in Chapter 9.3 - 9.5. I further provide summarising answers to the four questions in Chapter 9.11.

Questions that I have not asked are around the measurability of online social interaction and how this relates to an improved perceived quality of life (QoL) or psychological well being. Researchers in HCI with a psychology background or gerontologists are better suited to answer this question. My questions derive from a pragmatist stance (Hookway, 2013; Melles, 2008a) since I believe in the act of making to address societal challenges and subsequent reflection to generate knowledge.

1.8 Boundaries of the research

When I initiated my research it was important to me to start with a wide perspective and not to be restricted to a particular area too early since a wide angle perspective allows researchers to explore the topic from different fields and thus more holistically. Considering my previous career in usability and accessibility, the frequent reaction I got from others regarding my PhD topic, was that I look at the usability of a particular system or that I am fuelling my expertise in accessibility devices enabling older people to take part in social networking sites. I did not want to look at specialised equipment, websites or systems only purely from a usability or accessibility point of view. Although the majority of large research projects (EU SENIOR, AAL, NDA) addressing older people came from a health perspective I did not want to look at 'older people' with the view of only designing for their direct health problems, preventions or potential safety hazards.

I am more inspired by Blythe and Gaver et al.'s interpretation of ludic engagement for older people (Blythe et al., 2010), focussing on the fun and enjoyment aspect rather than achieving direct task goals. In work environments people experience tasks and results orientated behaviours, but most older people will not be working anymore. I subscribe to the notion that being playful is something we keep into old age.

> *"Play will be unpremeditated, evolving according to intrinsic motivation and moment-by-moment interpretation. For it is this lack of imposed structure and outcome that distinguishes play from work " (B. Gaver, 2002).*

Fulfilling intrinsic motivations such as curiosity, playfulness and nurture (e.g. befriending) has positive affects on the psychological well-being, which in effect makes a person healthier (Lester, Mead, Graham, Gask, & Reilly, 2011).

However, I have excluded from my investigation the topic areas of 'serious gaming', 'online dating' and 'collaborative working' since these activities indicate interactions

with a particular focus (or goal) rather than general playful activities that nurture friendly exchange between people[6].

Although my thesis addresses *inclusive Design* I did not choose to employ the inclusive design framework as methodology since I felt that an approach based on guidelines, tools and population statistics (i.e. the population cube) did not do the heterogeneous group of older people justice. Nevertheless, inclusive design is predominately "good design" (Redish & Chisnell, 2004) and I naturally have taken some of their principles into account such as flexible font sizes and good colour contrast (see Appendices on inclusive design 3.1.2 – 3.1.5).

Although the steps in constructive design research are similar to action research (Kock, 2013) and I have been working with Age UK Barnet and the KIT charity, my doctoral research was not action research since the TT was not permanently implemented nor did I follow-up any (behavioural or attitudinal) change with the clientele of either charity.

My research is context dependent, in this case it took place in London, UK. If similar research may be conducted in other countries in specific settings where older people gather, reactions to the TT may vary immensely. However, the overall design process I am promoting with my thesis should be repeatable in other contexts, countries and times by employing the design principles I have used. The process places emphasis on insights, inspirations, understanding and providing examples rather than 'facts' and generalisations.

[6] The existence of extrinsic goals can reduce the experience of intrinsic motivation, but this also depends on the particular type of person (Elliot & Harackiewicz, 1994).

1.9 Overview of the thesis's structure

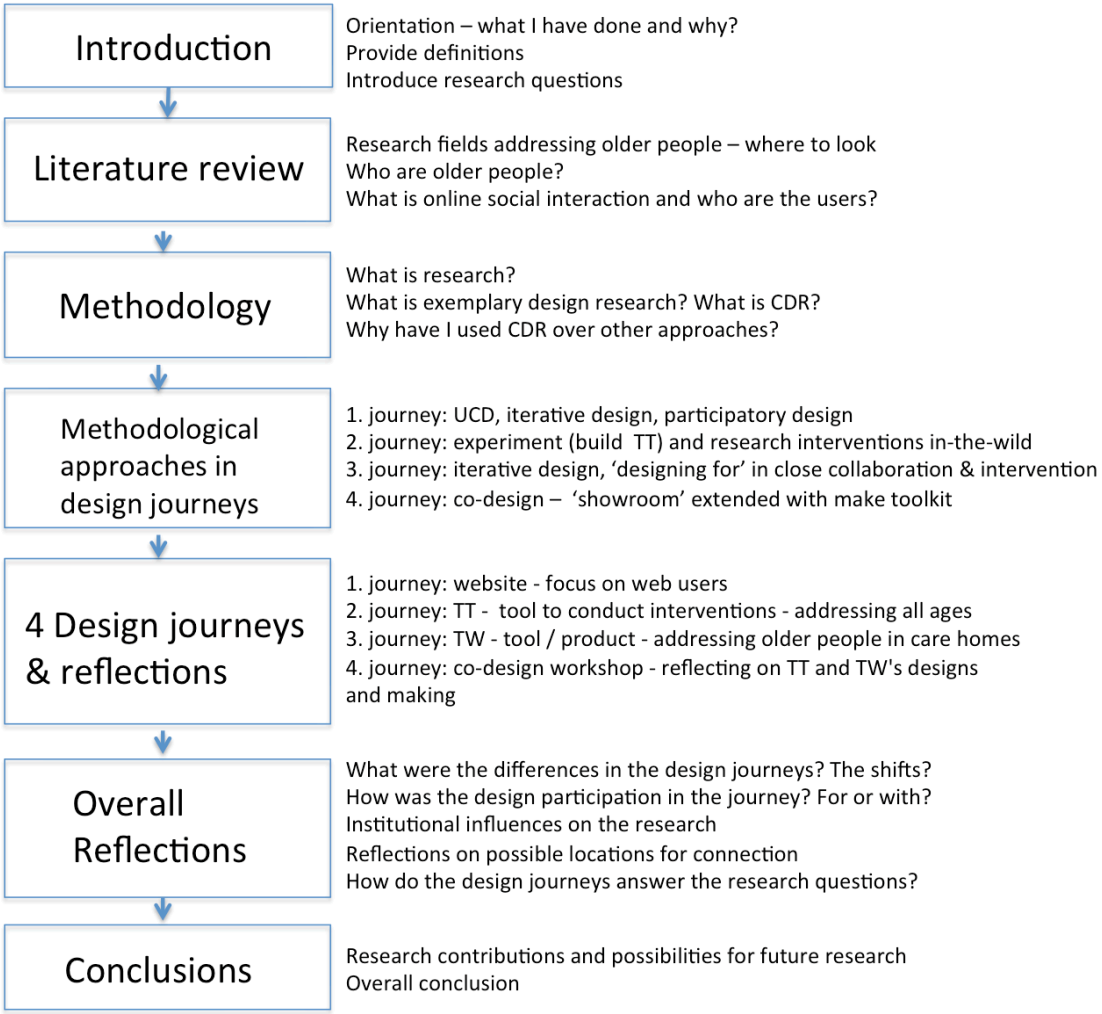


Figure 2: Flow of the thesis

The **first chapter** provides an introduction to the topic, describes my motivations for the research and offers definitions for key terms. It further describes the development of the research questions, my contributions to research as well as the boundaries of this research.

The **second chapter** informs about the challenges when conducting a literature review concerning older people, design and technology. It continues with a literature review on who older people are, what online social interaction is and where it takes place.

The **third chapter** introduces design research as a field and exemplary design research as design theory. The latter forms the philosophical foundations for CDR, which is discussed by presenting its places of research. The chapter concludes with a critique around CDR and the rational for choosing it.

Chapter four introduces the methodological approaches for the four design journeys:

The *first journey* can be summarised as an iterative design process employing a range of approaches for immersion into the topic combined with collaborative and emancipatory activities.

The *second journey* concentrated on making the artefact (the TT) and to have this proposition reflected upon by people through real world interventions.

The *third journey* can be compared to a collaborative product design process working with elderly residents and stakeholders to develop the TW.

The *fourth journey* employed co-design as an approach in order to collectively reflect on the TT proposition and to make propositions for the future.

The 4 design journeys are described in detail in the **Chapters 5-8**. Each journey will be reported sequentially, but at times understanding, learning and preparing happened simultaneously. Each design journey will start by establishing the context, describe the research activities and finish with reflections and contributions to the research questions.

Chapter nine presents my reflections on the overall research process and provides considerations and guidelines for fellow design researchers interested in older people and technology use. Major shifts in the journeys were reviewed and the differences discussed. With each journey there was a change in emphasis on designing for and designing with older people. However, as I describe in Chapter 9.3 the difference between for and with is not clear cut, particularly when working in a collaborative manner. Further, I discuss the influence of institutions (university, charities and care homes) and personal context on the design process. I also consider different combinations of audio-visual connections between places and point out challenges and concerns. Finally, I suggest modifications to the CDR model as provided by Bang et al. Chapter nine finishes with answers to the research questions drawn out of the design journeys.

Chapter ten presents the research achievements, possible future areas to research and summarizing conclusions.

Appendices. A comprehensive set of Appendices is included to supplement the main text. These mainly provide samples of data relating to each journey: questionnaires, interview transcripts, key correspondence, notices, observations, returns and the co-design workshop's summary report. Details regarding the technical aspects of the research, such as the production of the Teletalker (TT), Telewalker (TW) and the Video conferencing app (TT app), have also been included. The appendices also

contain elements of a literature review that whilst not now central to the main thesis, provides an indication of the scope of the initial research.

1.10 Contributions to knowledge

My doctoral research developed different types of contributions for 4 overlapping fields of research: design research, participatory design, interaction design and Human computer interaction.

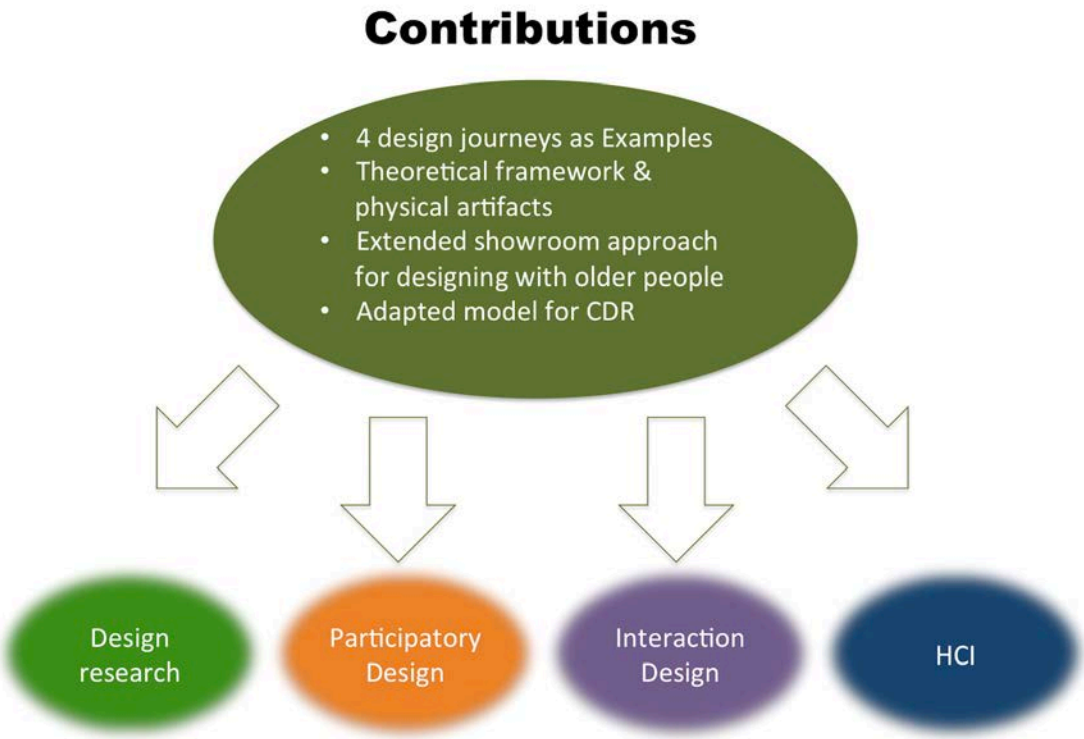


Figure 3: Diagram showing the fields where my research contributes to knowledge

Establishing CDR theoretically*:*

- My application of CDR as meta-methodology furthered its establishment as a flexible, but reflective methodology for the construction of artefacts and interventions (see model in the Reflections Chapter 9.10). The updated model can be used by design researchers and interaction design researchers to map out their design journeys and to make CDR projects more easily comparable.
- My discussion on the *showroom* and *field* overlap will be of interest to design researchers and interaction design researchers and point to a new way of dividing the places of research (see Chapter 4.2.4).
- The development of the *extended showroom* approach – a synergy of approaches from CDR and co-design and the report on the execution of the workshop

contribute to knowledge in the participatory design community as well as in the design community (see Chapter 8.3).

Providing online social interaction design research examples:

- The TT and TW research journey are documented research examples on designing online social interaction for interaction and design researchers to learn from (see Chapters 5-8 and Chapter 9).
- The experiences collected (as narratives and examples) as well as the strategies used during in-the-wild research contribute to knowledge on design interventions, and are likely to be of interest to interaction design and design researchers (see for example Chapter 6.7.4).
- The first design journey provides an example of an immersive journey to develop a web design solution. The insights gained from the reflections on this journey are likely to be of particular interest to researchers in the HCI community where the concept of the user is still dominant (see Chapter 5.4.3).
- My insights into design principles for designing online interaction technologies for and with older people, established through my research (for a summary see Chapter 9.11.2) will be useful for other researchers interested in developing online technologies

Knowledge gained on and around older people:

- Through my research I developed guidelines for empirical research with active older people that are likely to be useful for any researcher, who comes in contact with older people (see Chapter 9.6).
- I discuss logistical, practical and ethical considerations for conducting empirical research with vulnerable older people, and this is likely to be useful for any researcher, who comes in contact with older people (see Chapter 9.7).
- Situated knowledge gained on social and online social interaction behaviours by residents in two London care homes and about care home culture (see Chapters 7.2, 7.4 and 9.82).
- Situated knowledge gained on social and online social interaction behaviours by Age UK daycentre clientele and their organisation (see Chapters 6.6 – 6.8 and 9.82).

The physical artefacts, which externalise implicit hypotheses:

- 2 Teletalker kiosks prototypes (TT) incorporate the theoretical framework, and will be of interest to interaction design, design and HCI researchers and also Telepresence researchers (see Chapter 6.2).

- 2 Telewalker prototypes (TW) - one infrared, one with a button box – to externalise a concept for a product with ludic qualities addressing care homes residents (see Chapter 7.3). This concept will be of interest to researchers interested in life enhancing products for the elderly.
- Bespoke developed software for the Teletalker connectivity system, which can be used from any computer running Firefox, Google Chrome or tablet running Android (see Figure 55 in Chapter 7.3). This software is likely to be of interest to researchers in the HCI, Telepresence, Computer supported collaborative working and interaction design community. I will make the Teletalker app, now re-named *'TTconext'*, available on the Teletalker.org website for non-commercial use.

Chapter 2

2 Literature review: overview

This chapter is split into 3 parts. The first part highlights relevant fields of research for researching older people and (system) design. It provides a flavour for the challenges and hurdles a researcher can experience when researching the topic of older people and the design of computer, information systems or other forms of interaction design. The second part addresses the question of who older people are and how design researchers can make sense of them as a target audience or group. It introduces the concepts of disability, vulnerability, active aging and life transitions. The third part provides a literature review to inform my understanding of online social interaction as a basis for my design journeys. It presents current forms of online social interactions and discusses its users. It further highlights the barriers to older people taking up online social interaction and the current trend of embedding online interaction with offline interaction. Specific topic reviews in literature were conducted during the design journeys, and discussed in the chapters accordingly.

2.1 Research fields and sources addressing older people and design

Reviewing the literature around the topic of older people and design has been challenging for several reasons. It was not so much lack of literature, but more the issue with finding the relevant keywords for the search and having the awareness of where to search, be it in academic literature or through research and reports published through other sources. A considerable amount of design research is conducted confidentially in industry or for blue-sky research departments and written about in outputs, which are not necessarily accessible to the public nor to a specialised academic. On the relevant PhD Design mailing list Love suggested a colour scheme for the sources of literature by labelling white, yellow, grey all literature that is accessible through the Internet and free of charge. He described literature as blue and black for reports, proceedings, industry reports that are inaccessible or only have restricted access due to limited number of paper copies (Love, 2014).

In addition, as older people are described with different labels (e.g. elderly people or senior citizens) in different research projects and the starting age is variable, it was difficult to pin point the most effective keywords. The same held true for developing the keywords regarding the design of online social interaction. When I started my research in 2008 I had originally over 30 keywords. Considering my interest to keep an open mind about the platforms it entailed words such as “interface design” and “interaction design”.

At the time I reviewed literature in the fields of

- Human computer interaction
- Usability engineering
- Product design
- Computer supported collaborative work
- Sociology
- Psychology
- Communications
- Gerontology

In appendix 1.1 I list the databases, journals and centres of research that I consulted for the literature review.

There also has been a notable spike in disseminated research around older people and computer use in HCI and Gerontology since the middle of the last decade. Wagner et al. captured this trend with their formidable multi-disciplinary literature review on this topic (Wagner, Hassanein, & Head, 2010, p.872).

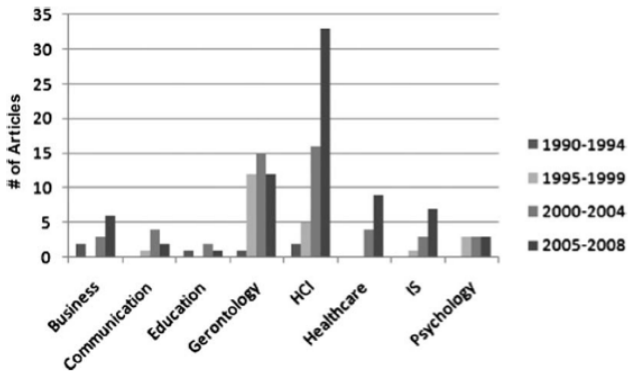


Figure 4: Diagram by Wagner, Hassanein & Head to show the increase of literature in the different fields

With advanced time and learning around the fields as well as with the changes in framing the design space of my PhD design journey I adjusted my literature review remit accordingly. Literature reviews and project reviews that I undertook with each of my design journeys are included in the relevant section of the journey. During my

PhD journey I also found that it was more effective to follow certain journals and specific authors rather than working with Zetoc[7] alerts based on keywords.

I haven't been able to cover every area and field that may be relevant to multi-disciplinary research with older people and systems design. For example, I have left largely unexplored the area of nursing studies, considering the developments of systems for carers this would be an interesting angle to learn more about vulnerable older people. I also have not exhaustedly looked at the integration of systems design and architecture, or the social work concerning active older people or research with older people out of the LGBT movement. These are interesting, informative areas, but do not directly impact on my research.

In the following section I provide an overview of the historical development of design research around older people. Whilst not exhaustive it presents the relevant key developments.

2.1.1 Discovering older people as subject for design research

Since the 1950s there has been a general trend of increased longevity, with older people becoming a larger demographic group than previous centuries (Laslett, 1996).

The larger number of older people required a different type of attention by society than previously given. While the cost for care increased with a population that enjoyed longevity, the Potential Support Ratio (PSR), which is the number of people aged 15-64 who could support one person over 65 years, has been declining in the developed world (Clarkson & Coleman, 2013). During the second half of the 20th century older people, particularly when they were affected by illnesses or disability, were seen as "them": a group that needed to be catered for specifically and which was frequently marginalised (Laslett, 1996).

The Royal College of Art (RCA), the Imperial College and the Helen Hamlyn foundation were at the forefront in conducting design research with older people since the 1970s when the 'Design for Need' concept drew attention to older and disabled people (Clarkson et al., 2003, p.48ff). The idea was to educate designers from the arts and engineering fields to work in collaboration with target audiences to achieve innovative design outcomes. User forums, panels and other platforms to give older

[7] Zetoc is a service that provides access to the British Library's electronic table of contents of journals and conference proceedings from 1993 to date.

and disabled people a voice were set up. Mostly under the methodological approach of action research new products from practical to life enhancing designs were developed. Examples were a jar that could be opened with one hand, a mobile washing unit, the third age car, a hand-driven trike and easy to hold cutlery (ibid.)

Since the trend of a lager demographic group of older people has been seen throughout Europe, it was not unsurprising that European alliances were formed in the 1990s in order to conduct further research in this area. In 1994 the Design for Ageing Network (DAN) was set-up by a European team with funding from the European Union to promote applied good design that included addressing the needs' of older people (ibid.).

This trend continued as new methodologies for designing for older people and people with special needs were developed such as USERfit (Nicolle, 1999) and design-led methodologies during the *Presence* project (Hooker & Kitchen, 2014). In 1999 IDEO and the Helen Hamlyn Foundation collated the range of user research methodologies for designers in the "The methods Lab" publication (Aldersey-Williams, Bound, & Coleman, 1999).

2.1.2 The difficulties in conducting empirical research with vulnerable people

Nicolle working at Loughborough's centre for Human Sciences and Advanced Technology (HUSAT) in 1999, described the issues conducting empirical research with disabled people and elderly people succinctly (Nicolle, 1999, p.2ff):

- *"It may be difficult to obtain a representative sample of users with different types of impairments*
- *It may be difficult to obtain precise and comprehensive information because the user has difficulty in communicating his or her views*
- *It may be difficult to obtain precise and comprehensive information because the user is too fatigued or in pain to complete the interview or experiment (or in the case of simulator testing, has possibly succumbed to simulator sickness)*
- *It may be necessary to use more than one technique to answer a question, thus increasing resources needed to ensure complete user involvement*
- *The designer or evaluator may need specialist advice, tips or protocols (e.g. advice on carrying out testing in a driving simulator with people with mobility impairments, or how to ensure successful feedback when involving people with communication difficulties*

It is necessary that ethical procedures are always followed, which is more difficult to ensure when some participants in the study are not able to give their consent (e.g. people with dementia)"

Although not every older person has a disability, this list of issues seems to hold true for when conducting research with older people due to the large diversity and the dimensional consideration of vulnerability. As a researcher it is difficult to assess the level of vulnerability or disability, when the older person is not aware of or denies their sense of risk.

In addition, it has been reported as a challenge to keep older people on track to answer a question, rather than diverting from (K. Brown & Harris, 2009; Massimi, Baecker, & Wu, 2007). It also appeared that older people are better at critiquing something tangible rather than thinking of something completely new (Lindsay, Jackson, Schofield, & Olivier, 2012; Massimi et al., 2007). When researching topics related to "social isolation" in particular, the question begs how to find and contact participants, who are socially isolated and disconnected (Sokoler & Svensson, 2007).

2.1.3 The trend for multi-disciplinary research

In fields such as sociology and gerontology the trend to research older people from a multi-disciplinary perspective had emerged. In 1999 the Economic and Social Research Council (ESRC) started the 'Growing Older Program' focussing on how to extend the quality of life (QoL) in old age. (I will write more about QoL in section 2.2.4) The Engineering's and Physical Science Research Council's (EPSRC) initiated the knowledge transfer for extending the quality of life (KT-EQUAL) and Strategic Promotion of Ageing Research Capacity (SPARC) programmes. In 2005 UK's 5 research councils[8] agreed with the need for interdisciplinary and multi-disciplinary research into ageing and set up the New Dynamics of Aging (NDA) programme. The NDA (2005-2012) was the largest research programme in the UK. It supported:

"The development of innovative multi-disciplinary research groups and methods to advance the understanding of the dynamic forces which influence ageing well and to provide a sound evidence base for policy and practice relevant to older people's quality of life." (Hennessy & Walker, 2010, p.57)

Although the multi-disciplinary research into ageing considering the quality of life (QoL) had started, only few of the research activities were disseminated by 2009. In this

[8] AHRC Arts and Humanities Research Council. BBSRC: Biotechnology and BiologicalSciences Research Council. EPSRC: Engineering and Physical Sciences Research Council.ESRC: Economic and Social Research Council. MRC: Medical Research Council

respect I did not find many examples of research directly relating to online technology design and social interaction with my first rounds of literature reviews.

Another growing multi-disciplinary research area since the mid 1990s were projects and related literature in telehealth and telecare. Telecare can be defined as "*the use of Information and Communication Technology (ICT) to support health and social care remotely*" (Barlow & Hendy, 2009). The Telecare Services Association describes how "*Telehealth enables individuals to take more control over their own health, and becomes an intrinsic part of the individuals care pathway, with information about their health condition being monitored regularly to flag up issues before they become 'care critical*'" (Telecare Services Association, 2014). European countries and the EU have the agenda to investigate the use of Telecare technologies to alleviate the burden on the social system (e.g. AAL). By 2011 over 9000 Telecare pilot projects had been conducted (Barlow & Hendy, 2009), of which several use online video connectivity (Blackburn, Brownsell, & Hawley, 2011). However, Telecare still has major hurdles to overcome, in particular in regards to technology acceptance by the patients (Bouwhuis, Sponselee, & Meesters, 2012).

The most prominent academic publication outlets for Telehealth research include the Journal of Telemedicine and Telecare, and the International Journal of Medical Informatics. Due to the interdisciplinary nature of the topic, publications for Telehealth can also be found in the Gerontologist, Gerontechnology, Journal of Assistive technologies, Journal of Social Issues, Personal and Ubiquitous computing to name a few. European networks (e.g. AAL, ehealthnews) and the individual countries' health departments also issue relevant reports and news on implementations of Telehealth projects. I write more about specific projects related to Telehealth in the appendix 4.1.3.

Overall, the multi-disciplinary trend brought home that any inquiry addressing older people and their experience is better placed to consider multifold aspects and dynamics in the individual context of the older person(s) from a multi-disciplinary perspective.

2.1.4 Conclusions

Many hurdles were experienced when conducting a literature review around older people and (systems) design research. Firstly, finding the relevant keywords for the search was difficult since older people were categorised differently age-wise (sometimes starting with 55, 60 or 65 years) and referred to with different terms (elderly, elders, senior, the aged).

Secondly, there exist large amounts of literature in various disciplines, and since many research projects were conducted from a multi-disciplinary perspective, the dissemination is dispersed and interweaved. In HCI, in particular, from 2005 onwards there has been a significant increase in reported research around older people and computer use. When researching older people it is important for the researcher to know where to look. For this the researcher needs to have the awareness of where to look and whether it is accessible. Some design research (not necessarily involving a computer system) projects are published in outputs (e.g. company reports, past exhibitions), which are for researchers inaccessible at the time of research.

Academia[9] became interested in older people as research subject in the 1970s. It was the first time in Europe and in other parts of the world where older people made up a significant part of the population and the demographic model changed from a pyramid to the shape of a mushroom. Born out of social and political climate in the 70s, “Designing for needs” focussed on disabled people and older people and was employed as a source for innovation. Derived out of the people empowering movement in the 70s inclusion and participation was promoted. In the 90s several new empirical methods were developed for research with vulnerable people. Researchers found that conducting research with disabled and elderly people was challenging for several reasons. Some of the main issues were finding representative ‘people’, gaining accurate information and an increased time and preparation involvement.

The literature review brought out how research with older people needs to consider multi-fold aspects. Multi-disciplinary teams are best placed to interpret observations from different point of views whilst making the research effort worthwhile.

[9] For example, the British Society of Gerontology (BSG) was established in 1971.

2.2 Literature review: Who are older people?

The following section addresses the question of who older people are and ways of grouping them. It looks at the changes people experience with age. It introduces key concepts such as vulnerability, active ageing and life transitions. Further presents the scientific views on ageing research, which tend to come from a compensation perspective.

2.2.1 Who are older people?

There is no straightforward answer to the question of who older people are since the group of older people is highly diverse (Goodman-Deane, Keith, & Whitney, 2008; Newell, Dickinson, & Smith, 2006; Tinker, 1997). Apart from having reached retirement age e.g. the physical age of 65 years[10] and older, there are multiple contexts in which the older person needs to be considered. There are differences in physical and mental health, family situation, economic circumstances, gender, ethnicity, education, professional background, life experience, memories, interests and personality type to name a few. The difference in the older adult's individual situation might explain why a person 70 years of age can be a president while another person requires full time care at home.

The heterogeneity among older adults becomes even more obvious with recent increases in longevity (Harwood, 2007). Life expectancy in the UK is now 78.3 years for men and 82.4 years for women (United Nations, 2011).

As discussed in Chapter 1.3 grouping older people by the numerical age of a person may not be the most reliable way of making sense of the heterogeneity of older people. The introduced categories around young old and older old already include age ranges rather than specific starting points.

Another way of grouping (older) people is by considering phases in the life course. In the 1960s Erik Erikson was the first psychologist to consider human development as a life-span phenomenon (Harwood, 2007; Ziegler, 1992). Lifespan psychology deals with the study of the individual development from birth to old age. A core assumption of lifespan psychology is that individual development has not finished by reaching adulthood, but continues with "lifelong adaptive processes of acquisition, maintenance, transformation and attrition in psychological structures and functions" (P B Baltes et al., 1999 p.4). Erikson divides the personality development into 8 stages (Ziegler, 1992, p.191ff). The last one is called "late adulthood" and deals with

[10] and 63 years for women in the UK.

the development of ego integrity versus despair. Erikson has been criticised for focussing too much on closure in the last stage rather than on engaging aspects (Harwood, 2007).

Whilst investigating the reasons for the rise in popularity of Universities of the Third Age, Peter Laslett devised a fresh map of life based on his findings. He describes the life course as (Laslett 1996, p.193ff):

- *"Firstly, an era of dependence, socialisation, immaturity and education*
- *Secondly, an era of independence, maturity and responsibility*
- *Thirdly, an era of personal fulfilment and achievement (i.e. the third age)*
- *Fourth and lastly, the era of final dependence and preparation for death[11]".*

A third way of grouping people by age is by looking at cohorts. A cohort here being taken to comprise of a set of individuals who pass a crucial stage at approximately the same time; this stage can be the year of birth, but also, for example, employment or war participation (Carlsson & Karlsson, 1970). The most commonly known cohorts in the Western world are the baby boomers (1946-1964) and generation X (roughly 1960s-1980s).

The age groups I have researched, fall mainly into the cohorts of 'the silent generation' (1925-1945) and the 'Greatest generation' (1901-1924). However, with the literature review I did not find enough relevant information on these cohorts in the UK to gain a useful way of grouping older adults.

[11] Which may start 5, 10 or even 20 years into the third age. But when someone experiences a sudden death in their 60s for example, they didn't reach the fourth age.

2.2.2 What changes physically and mentally when we get older?

Human ageing - in the second half of life - is generally seen as a negative process, as a process of decline, downsizing and preparing for death. A typical image of a person's life cycle is the idea of a person going up the steps (first half of life) and when they reach around 50 years of age they go down the steps (second half of life) (Thane & Parkin, 2005).

Figure 5: The life and age of man (Thane & Parkin, 2005)

The general experience for most adults is that we encounter a physical decline from the age of 30 years. For example, our skin and muscles become less elastic, a decline in muscle mass reduces our strength (Stuart-Hamilton, 2006). With growing older, we often have increasing physical, visual, auditory and cognitive impairments. For some, the impairment can happen in all four areas, some areas can be more quickly and more seriously affected. Other older adults may experience some decline only in one or two of the areas such as hearing and vision. The range of physical changes that can occur with age and how it might affect computer use are presented in appendix 1.1.1-1.1.4. Older people and the concept of disability, which has no unifying definition, is also provided in appendix 1.1.5.

2.2.3 Vulnerable older people, life transitions and active ageing

I distinguish between young old and older old people (as presented in my definition in 1.3) and between vulnerable older people and older people, I also discuss the concept of active ageing. The borders between those descriptors (vulnerable and active ageing) are fuzzy and have to been seen as dimensions rather than set categories.

A report prepared for the European commission by European Consumer consultation group (ECCG) describes the vulnerable consumer as (Giovannini & Pachl, 2013, p.7):

> *"The concept of vulnerability is linked to individual characteristics like age as well as physical and mental ability. Often vulnerability implies an association with the concept of risk. For instance, children are vulnerable as they are often unaware of the dangers they face. Key risk factors for vulnerability include age, disability, literacy and numeracy skills and other aspects of personal capacity and factors such as living with physical health issues or mental illness, suffering from a cognitive impairment, living with learning disability, etc. must also be taken into account when talking about vulnerability."*

The ECCG recommends further research into the concept of the vulnerability to explore it as a dimension rather than a static concept.

At the CHI conference 2013 in Paris a workshop took place to discuss "Designing for and designing with vulnerable people" (J Vines, McNaney, Lindsay, Wallace, & McCarthy, 2014). Outcomes were explorations into a shared understanding of vulnerability and methods for research. Researchers in this workshop considered the complexities in crafting trusting relationships with vulnerable people (examples of people considered were: people with dementia, cerebral palsy, Asperger's syndrome, homelessness) and their support network by understanding their complex situation holistically. They further highlighted issues around the ethical procedures, which could potentially prevent vulnerable people from being heard in research or reinforce negative views around their vulnerability (ibid.).

The majority of vulnerable older people, who are towards the end of the vulnerability dimension scale, can be expected to live in a care home or with a carer at home. Some vulnerable older people may be vulnerable only temporarily, for example when someone has curable illness, or just moved into a new area or lost their partner. Romero et al.'s distilled with their research 3 main life changes in the ageing process that are likely to affect an older person's social and physical life style significantly:

"losing a partner or a close friend, physical or cognitive deterioration and moving to a care facility" (Romero et al., 2010, p.490).

They suggest developing design solutions that consider the dynamics in the life of the (frail) older person and of their social networks by focussing on the "design for cohesive social environments supporting familiarity and promoting participation" (ibid, p.494). I understand their suggestion as not to view an older person in isolation, but to consider the situation holistically (person's character, health, transitions, social network, environment, the back story) and to imply flexibility in the approach. It could be that after a period of change and adjustment, an older person adapts positively to the new situation and becomes a more active older person on the dimensions for "active ageing".

The concept of "active ageing" is also complex and not without its drawbacks (Stenner, Mcfarquhar, & Bowling, 2011). The strategy of "active ageing" plays a key role in policy and practice as a global strategy for the management of ageing (Walker, 2009; WHO, 2014).

The active aging concept aims to enable the older population to remain healthy and possibly working to reduce the burden on health and social care systems. The word 'active' refers to an on-going involvement in social, economic and cultural activities including those activities enjoyed in the daily living. One of the issues with the concept of *active ageing* is that it is very personal and subjective in how people interpret the word 'active'. Stenner et al. discuss how the prescribed message of "active ageing" can indeed have the opposite effect where older people might react with complacency or opposition to a push from 'higher up' (Stenner et al., 2011).

Most young old are active older people, but there are also some vulnerable younger older people. But there are also a number of active older people, who are part of the group of the older old. Notable examples of online active oldest old are YouTube blogger Geriatirics1927 (Harley & Fitzpatrick, 2008) and Ivy Bean, the oldest Tweeter (see also Chapter 5.6.1).

There are tools such as the active ageing index to measure active ageing (see figure 6). The European Commission's Directorate General for Employment, Social Affairs and Inclusion (DG EMPL), and the Population Unit of the United Nations Economic Commission for Europe (UNECE) have jointly developed the active ageing index (DG EMPL & UNECE, 2014). The index aims to measure *"the level to which older people live independent lives, participate in paid employment and social activities as well as their capacity to actively age" (ibid).*

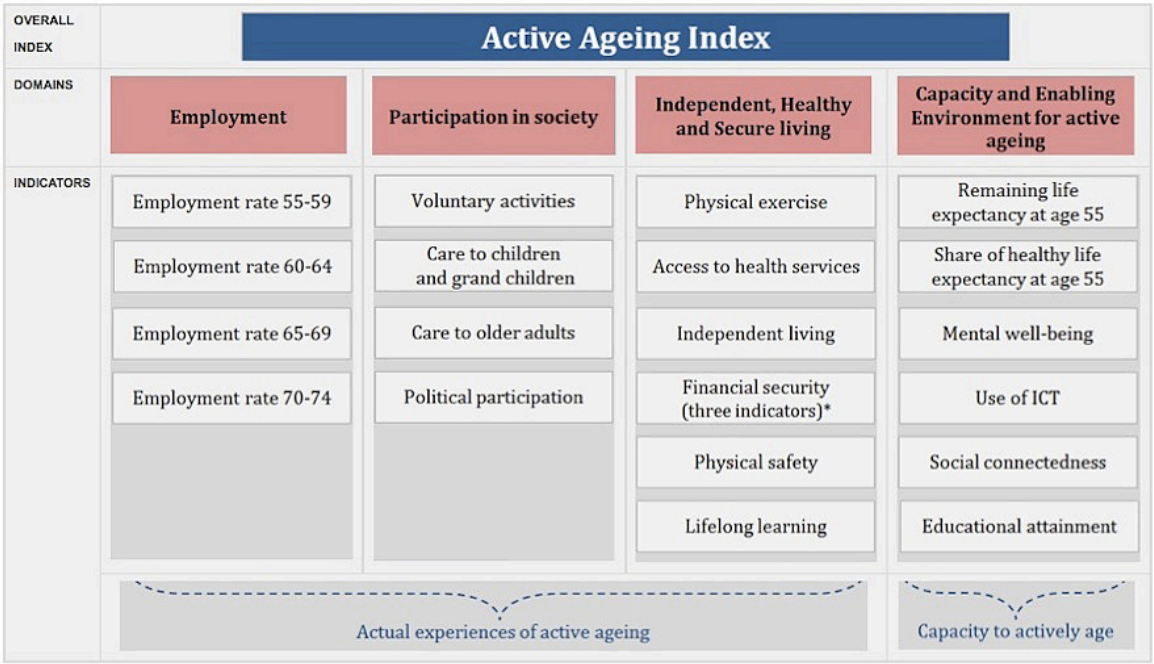


Figure 6: Screen shot of the Active ageing index tool

The high number of interpretable indicators shows how complex the categorisation of an older person's life style and context can be.

The following section presents the scientific views on ageing research, which tend to concentrate on addressing impairments and challenges with growing older rather then focussing on capabilities that are maintained.

2.2.4 Scientific perspectives on ageing

Most scientific perspectives share a negative view on ageing[12] and try to find ways to 'improve' the quality of life. Quality of life (QoL) and 'well-being' have been long standing and debated concepts, but are still used in order to measure change and improvements.

Both concepts entail subjective aspects, which make the concepts challenging as a reliable and accurate measuring tools (Hartnett et al., 2013; Stiglitz, Sen, & Fitoussi, 2010). For instance, Hughes suggests looking at seven different levels in order to measure quality of life, which range from individual characteristics and personality factors to physical and socio-economic factors (B. Hughes 1990). Information needs to be collected from either older persons themselves or care professionals, which can lead to differences in answers provided and in actual perception.

[12] An interesting point Langer raises is that the term ageing has already negative connotations. Similar to the idea that the word 'day' could mean 24hours, but is usually associated with the brighter hours, the term ageing is usually associated with the negative aspects of growing older (Langer, 1990, p.90). Despite the emphasis on the lifespan perspective where people continue to develop with age, in science and academia the use of the word "ageing" is still more persistent than the term "development".

Biological and biomedical approaches try to understand the ageing process with the aim to alter the progression of age-related illnesses, to enhance longevity and to improve quality of life, e.g. (Pekovic et al., 2008). Health sciences and social care look at the impact of the increasing number of older people in the UK and what this means for pension, housing, transport and care services (Börsch-Supan & Wilke, 2009).

Gerontology, the scientific study of the biological, psychological, and sociological phenomena associated with old age tends to look at problematic aspects of getting older such as social exclusion rather than the positives. Geriatrics[13] can be described as the branch of medicine or social science dealing with the ill health and care of old people. Most psychological approaches to 'ageing' focus on decline and deficits in growing old. For example, a lot of attention is paid to memory and how we forget when we get old (P. B. Baltes, Sowarka, & Kliegl, 1989).

All these perspectives investigate issues around normal age-related decline or pathological ageing (e.g. Parkinson or Alzheimer's), but there is very little research around what might improve or remain unchanged with age (Harwood, 2007). In my literature review I found some indications of age-related 'improvements'. For example, Salthouse found that vocabulary increases steadily throughout the life span, however its disputed on how to measure this effectively (Bowles & Salthouse, 2008; Whiting et al., 2003). Researchers found that storytelling abilities improve with age where the older person capture their audience with an emotional and well-paced accounts (Birren, 2004; Gould & Dixon, 1993). Psychological research showed that a well-adjusted older person is emotionally more balanced (Carstensen, Isaacowitz, & Charles, 1999; Labouvie-Vief, 2005).

2.2.5 Conclusions

Searching for answer to the question "Who are older people?" produced no simple answer. Older people are very diverse. With growing older there are significant physical and mental changes possible, all of which are likely to affect our ability to use computers in some respect. The distinction between impairments, reduced capabilities and disability is fuzzy (since disability is already not well defined). Older people might experience some form of impairment, which they can compensate for with simple things (turning up the TV volume) and therefore lack the awareness or an accurate perception of their diminishing capabilities. Older people, who suffer several major impairments, are likely to live in care homes or with a carer. In particular, mild cognitive impairments and motion capability loss are likely to affect

[13] A friend of mine training to be doctor in the UK said that in the Royal Free Hospital London 'Geriatrics' means patients over at least 80 years old. This conversation took place on 14th Nov 2011.

people over 75 years of age. Designing for the compensation of impairments can lead to specialised accessibility equipment, which is frequently associated with stigma. Although hearing aids, walkers, bathroom handlebars are useful, an older person might reject the use of the device / product because it communicates the message that they are vulnerable and in need.

The concept of vulnerability is complex and has to be understood as a dimension rather than a category. Vulnerability as a concept is linked to risks. It is about protecting the vulnerable person from risks (and this includes children, pregnant women, patients etc.). Specific life transitions such as losing a partner or a close friend, physical or cognitive deterioration and moving to a care facility can make an older person temporarily or generally more vulnerable. A vulnerable older person can still be an active older person depending on their environment and support they receive. The political strategy of active ageing intends to keep older people as fit and healthy as possible to reduce the burden on the health and social care system.

However, the interpretation of active ageing is very subjective by the individual and being prescribed how to live your life is not necessarily well received by the older population. Life course development psychology supports the view that personality continues to develop into old age. In line with this view Laslett introduces the term “the third age” as the age of fulfilment, a time where people are retired (or in retirement age) and pursue voluntary and rewarding activities (Laslett, 1996). The third age is not based on the numeric age, but places emphasis on the time in life where older people engage with aspirational activities (e.g. volunteering, learning, creative outputs).

Most scientific perspectives concentrate on the losses or issues with ageing and aim to increase the quality of life or a person’s well being. A minority of ageing research focuses on aspects that improve or are well maintained with age. For instance, Salthouse at Cognitive Aging Laboratory in Virgina investigates older people’s vocabulary, which is one aspect that appears to be well maintained with age. I considered this maintained capability as a key strength for older people to be involved in research as I describe with the storytelling workshops in Chapter 5.3.3ff.

2.3 Literature review: What is online social interaction?

In order to design an interface or system that facilitates online social interaction for older people I need to ask the question what online social interaction is and how it relates to offline social interaction. For this, I firstly look at ways in which social interaction can be defined. Then an overview is given of the historical development of online social interaction and on how the World Wide Web turned into a social place with social media sites. The users of social media sites are discussed and which barriers exist. I further discuss the question whether social connection can be achieved through online social interaction.

2.3.1 What is social interaction?

Misoch, who is positioned in the field of communication studies, writes:

> *Human communication – transmitted via a medium or not – always signifies a situation of exchange i.e. a situation of social interaction. One talks about* ***social interaction*** *when the actions of the actors are related to one another and when the person's behaviour is orientated by the other person's expectations, attitudes and behaviour. (Translation by author, Misoch, 2006, p.108)*

Misoch has based her definition on Weber's description of "soziale Beziehung" (social relationship). Weber's main idea behind the term is that the people involved are interacting with each other with the intention of doing so meaningfully. If people don't interact with the intention of doing so meaningfully, they might ignore the other person or behave in a way that any communication feels 'unsocial', but it could still mean that they communicate with each other. According to Watzlawick "one cannot not communicate", which in other words means that even when you don't react to a person or communicate back, you have communicated that you don't want to communicate (Watzlawick & Bavelas, 2011). Watzlawick calls a single communicational unit: "a communication" and a series of messages exchanged between persons: "interaction".

Wiberg, author of the book "the Interaction Society", defines the term interaction by looking at concepts of communication and collaboration (Wiberg, 2005). According to Wiberg, communication is the exchange of information between people and collaboration is when two or more people are handling a common object (Fig. 7)

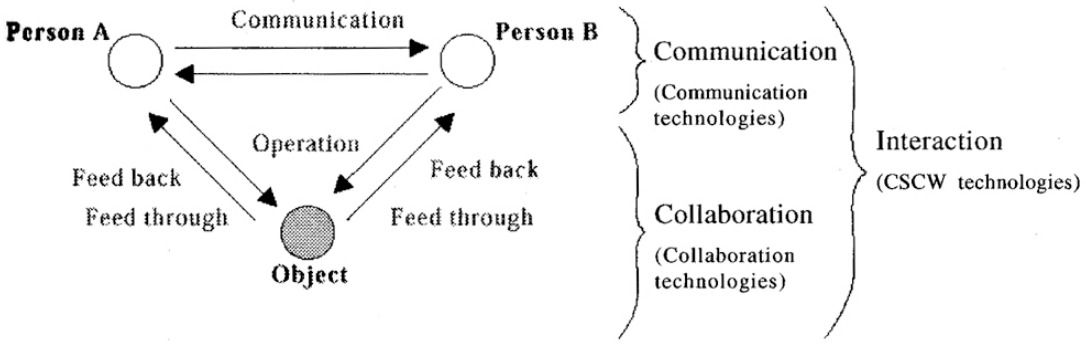


Figure 7: Definition and interaction support and how it relates to the concepts of communication and collaboration (Wiberg, 2005 p.3)

Wiberg's diagram shows feedback loops running between person A and person B and the handled object. The interaction takes place on two levels. One level is between people; the other level is between a person and an object in the environment. According to the diagram collaboration is a subset of communication, but still part of interaction. Computer Supported Cooperative Work (CSCW) technologies facilitate this type of interaction.

In my view **social interaction** takes place when people, either as individuals or as a group, intend, and want to interact, in an understanding[14] manner[15].

Even though every business communication has a social element, I am only interested in the social interaction that involves (random) acquaintanceship, friendship, companionship or family relations.

I define the term online as showing a state of connectivity through digital electronic means where data can be transferred.

I consequently define 'online social interaction' as happening in an environment where at least two people are connected through digital electronic means and can transfer data with the intention of wanting to interact with the other person in an understanding manner.

In addition, I believe that **one can choose to take part in online social interactions** or avoid online social interactions in contrast to un-mediated social interactions i.e. Face-to-Face interactions.

[14] Please note that Niklas Luhman holds the view that we are never able to fully understand each other since we are not able to look into the other person's head (Luhmann, 1987). I do not disagree with his view, but feel that we understand each other enough to interpret the other person's intentions and therefore do not discuss his theory further.

[15] One could communicate in an understanding manner that she / he doesn't want to communicate (anymore), which I still define as reciprocal communication and thus interaction.

2.3.2 What forms of online social interaction exist?

With the arrival and the establishment of the Internet, 'email' became and still is the most commonly used form of online social interaction. Having an email address allows people to send electronic messages to each other similar to writing a letter. Since its invention in the 70s, its popularity grew in the early 90s and now 98% of al UK Internet users have an email address (ONS, 2010, 2014). Since I started my research in 2008 sending emails has remained the most popular activity when using the Internet, followed by finding 'Information about goods and services' (ONS, 2008, 2014).

Other forms of early online social interaction were 'message boards' and 'forums', which were places where site visitors could discuss topics by leaving messages for each other (Crumlish & Malone, 2009).

In the mid90s chat rooms such as Internet Relay Chat (IRC) and instant messengers like AOL messenger were popular tools for people to communicate over the Internet. Chatting meant that users were typing messages to each other, sending and receiving them instantaneously, rather than asynchronous communication like email, where a user can continue the communication with time delay. Instant messenger is still a popular tool, though sites like Facebook, Googlemail or Skype include instant chat in their offer, so there is less need to sign into text-chat only application like *WhatsApp, Telegram* or *KIK*. Blackberry smart phones are particular popular with business users because of their secure instant message application. Chat rooms can have elaborate graphical interfaces allowing users to immerse themselves into a virtual 3D world. The most well-know example is "Second life" with an estimated 3.1 Millions registered users worldwide in 2007 and with a 'guesstimated' 128.300 regular users logging in to have their avatar interacting with other avatars (Fulton, 2007).

Another example of an active chat room, which makes use of both video transmission and instantaneous chat, is 'Chat roulette'. The idea behind is that one user is randomly connected to another user and stays connected until one of the users decided to 'press them away'.

2.3.3 The World Wide Web as a social place

With the emergence of Web 2.0 at the beginning of the 21st century the World Wide Web has become an increasingly *social place* rather than a place for information look-up

or transactions (Bell, 2009). With Web 2.0 the so-called *social networking sites* have emerged.

Ofcom defines social networking sites as:

> *"Sites, which allow users to set up online profiles or personal homepages, and develop an online social network" (Ofcom 2008 p.10).*

Boyd goes into more detail with her definition:

> *"We define social network sites as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site" (Boyd & Ellison, 2007).*

There has been an explosion of social networking sites based on accumulating 'friends', a shared interest or on a geographical location. Ofcom claims that social networking sites are mainly built around existing social relationships and connections with people and that this made social networking sites so popular (Ofcom, 2008).

In 2010 Wikipedia listed about 345 social networking sites although it is not exhaustive and the number continued to grow (Wikipedia n.d.). Some examples to demonstrate the range of topics social networking sites cover are:

- Geni.com (Families, Genealogy research)
- MySpace (Entertainment platform for artists and other users to connect)
- Ning (Users create their own social networking platforms)
- FriendsReunited (To find classmates / friends you have lost contact with)
- Facebook (FB) (platform to connect with friends and people who are also interested in the same FB apps)
- Flickr (Photo sharing, commenting, photography related networking, worldwide)
- YouTube (Storing, uploading and sharing of self-made movies)

Not all of the sites fit exactly the definition as given by Boyd. For example YouTube is a site where you can view videos without having to sign in. As a consequence, I prefer to call this a list of **social media sites**[16].

[16] Kaplan and Haenlein provide a useful definition of social media as a general term and provide a classification of 6 different categories by characteristics: collaborative projects, blogs, content communities, social networking sites, virtual game worlds and virtual social worlds (Kaplan & Haenlein, 2010).

2.3.4 Who are the users of online social interaction?

In order to answer this question I look at the numbers of Internet users by age groups and their Internet activities in the UK. Please note that I am concentrating on the Internet only since this is the main public place where online social interaction happens in the UK and for which I am able to retrieve statistics.

The 2009 ONS Internet access survey reports 37.4 million adults (76 per cent of the UK adult population) had accessed the Internet (ONS, 2009, p2) This has been an increasing trend with now 22 million households (84%) in Great Britain that had Internet access in 2014, which is up from 57% in 2006 (ONS, 2014).

Approx. 42 % of people over 65 years access the Internet daily, which is triple increase since records began in 2006 (ONS, 2014, p3). However, over three quarters of people over the age of 75 years are not connected to the Internet (Lane Fox, 2010, p.12). In comparison 96% of 16-24 year olds accessed the Internet within the last 3 months and 82% everyday (ONS, 2008)

The 2010 ONS Internet access report includes the table below, which presents users by age groups and illustrate their activities on the Internet (ONS, 2010, p.14)[17].

Table 6: Internet activities by age group, 2010

	16-24	25-44	45-54	55-64	65+	All
Per cent						
Sending/receiving emails	88	90	89	91	87	90
Finding information about goods and services	64	76	80	83	72	75
Using services related to travel and accommodation	50	64	70	72	62	63
Internet banking	45	63	54	53	34	54
Reading or downloading online news, newspapers or magazines	52	53	51	47	40	51
Listening to web radio or watching web television	59	47	45	34	24	45
Posting messages to chat sites, social networking sites, blogs	75	49	31	19	8	43
Playing or downloading games, images, films or music	61	43	32	24	17	40
Seeking health related information	27	42	39	44	36	39
Uploading self created content to any website to be shared	50	43	28	29	22	38
Consulting the Internet with the purpose of learning	47	34	34	30	27	35
Looking for information about education, training or courses	47	36	27	19	7	32
Downloading software (other than games software)	35	34	23	27	18	30
Looking for a job or sending a job application	38	32	23	11	1	26
Telephoning or making video calls (via webcam) over the Internet	30	25	22	17	15	23
Selling goods or services over the Internet	16	28	20	18	9	21
Donating to charities online	10	13	15	13	7	12
Doing an online course	11	8	7	5	3	8

Base: UK adults who accessed the Internet in the last three months

Figure 8: ONS table of Internet activities by age group

It illustrates that 90% of all the people that go online send and receive emails and that this figure is nearly the same across all age groups. In contrast 75% of all 16-24 year old users that go online post messages to chat sites, social networking sites and blogs, but only 8% of all users over 65 years and older do the same.

[17] The reason I employ a table from 2010 is because that the following ONS reports did not provide a table overview by age and activities.

The list of Internet activities has considerably changed from the 2008 ONS table. The following activities were added:

- Doing an online course
- Listening to web radio or watching web television
- Posting messages to chat sites, social networking sites, blogs
- Playing or downloading games, images, films or music
- Uploading self-created content to any website to be shared
- Telephoning or making video calls (via webcam) over the Internet

I consider the last four activities of this list as 'online social interaction'. Comparing the percentage of users of those activities across the age groups, it becomes clear that the trend is the younger the person the higher the use of social media sites. Half of the 16-24 year olds upload self-created content and nearly a quarter of all 65+ users do so too. The difference between percentages in the various age groups is even smaller for video-telephony. This could be possibly because of the 'generation connecting' communication flow between grand parents, parents and children.

The Ofcom Internet use and attitudes bulletin 2011 and the ONS report 2014 confirm the trend that younger age groups use more social media sites than older age groups. Ofcom reports that the highest use of social networking occurs with the (16-24) age group with 83%, followed by 72% of the (25-34) age group and 67% for the (35-44) age group. The (55-64) age group and older shows a decline use of social networking sites (Ofcom, 2011). According to the 2014 ONS report young adults (16-24) accessed sites for social networking (91%) and playing games (68%) (ONS, 2014). Adults (aged 25 to 34) were reported to use the Internet mostly for day-to-day activities such as sending emails, reading information and online banking (ibid.).

The observations above correlate with the description of the NGU profile[18]. The NGUs usually fall into the group of higher income earners and are employed or students. People over 65 years are less likely to be part of the NGUs, and more likely to be part of the first generation users (William H Dutton & Blank, 2011, p.4).

[18] The Oxford Internet survey found the new group of Internet users, called Next Generation Users (NGU), integrates regular access to social media sites from portable computer devices during their daily routines. None of the over 65 age group are currently part of the NGUs (Dutton et al. 2009).

2.3.5 What are the barriers for older people to go online?

Nearly one in two of the (65-74) age group uses the Internet daily (ONS, 2014), but three in four people in the (75+) age group are not online at all (Lane Fox, 2010). The most frequently quoted reasons for all non-Internet users are lack of need, lack of skills, access to the equipment and cost (Lane Fox, 2010; ONS, 2014).

Other reasons that could be age related are attitudes towards computers. There is fear (Harwood, 2007) and concerns about the unpredictability of technology (P. Turner, Turner, & Van De Walle, 2007).

Sayago et al. investigated with an ethnographic study in a Spanish adult education centre the most and the least relevant barriers to accessing the web (Sayago & Blat, 2009). One key finding was that the use of the mouse and in particular double-clicking was a major stumbling block. Despite the existence of other input devices older people wanted to continue using the mouse, so they felt included and not excluded by having to use something differently designed.

Melenhorst et al. found with their research that lack of skills or cost are not necessarily barriers for technology adaptation but **lack of perceived benefits**. Melenhorst et al. studied older adults' motivation for technological adoption by running 18 focus groups in the US and the Netherlands discussing the use of email and traditional communication methods. The results showed that the perceived benefits are the primary incentive for older people's willingness to learn and engage with computer technology (Melenhorst et al., 2006).

Melenhorst et al.'s research implies that an older person is unlikely to take up computer use and go online, when they don't perceive benefits in doing so, even if lessons and computer use were provided free of charge to them. According to the socio-emotional selectivity theory (SST) the older person is likely to prefer spending their time with something he / she can already do and enjoy rather than having to learn something new when their life time is limited (writing a letter versus sending an email for example), see also appendix 3.2.3.

2.3.6 Can social connection be achieved through online social interaction?

There is controversy in the research literature about whether Internet use increases or decreases social connection between people and about its psychological benefits (Sum, Mathews, Hughes, & Campbell, 2008).

For example, Caplan, who investigates Problematic Internet Use (PIU)[19], has the hypothesis that lonely and depressed individuals might develop a preference for written online social interaction rather than Face-to-Face, which in turn leads to negative outcomes affecting the psychological well-being. Online communication might be particularly appealing to those individuals who perceive themselves to be low in interpersonal competence (Caplan, 2003).

One could argue that online social interaction could have the effect of reducing offline social interaction[20]. Data by the Oxford Internet survey, designed to provide detailed insights into the influence of the Internet on everyday life in Britain, shows that online social interaction does not seem to replace other forms of interaction with the family or friends such as interaction through visits, phone conversations and written communication. They found that the Internet most often complemented or supplemented other forms of contact. In particular, it increased the contact between friends and family who live further away, but also for a quarter of respondents it increased the contact with friends and family who live nearby (Dutton et al. 2009, p.37-38).

A disadvantage of online social interaction might be that two people who made contact originally online and then met Face-to-Face, found that the other person turned out to be very different from the ones they had imagined or expected through the written online dialogue.

This difference between the perception of the person through online communication and the actual person can be even described as *a risk*. It is particularly concerning for children or teenagers, who have less life experience with people and who might meet up after initial online contact with a 'new friend', who could turn out to be a

[19] The pathological behaviour with online interaction has not one unified definition, some researchers might call it PIU, others Internet addiction or compulsive Internet use. The number of people affected by it seems to be increasing with the increased presence of online media.
Dr Kimberly Young who helps people with Internet addiction writes on her website Netaddition.com that one out of eight Americans suffer some form of Internet addiction (Young n.d.). According to Young, Internet addiction is a global problem and there are estimates of 30% or more of the population in China, Taiwan and Korea, who may experience problematic Internet use. Considering the scale of this problem it could be called a socio-cultural phenomenon.

[20] Personal communication with Jonathan Culling, account manager at Foviance, in November 2010, who said "I blame Google that I talk less with my mum". He gave the example that previously he would have rung his mum to ask a question about cooking for instance, now he simply googles it.

sexual predator[21]. This concept of risk also points toward the vulnerability of the novice Internet user, where older people form the majority of novices.

Overall, my point of view underpins the view that online connectivity in a safe environment can support social connectivity, which can have a positive effect on the psychological well-being (Blažun, Saranto, & Rissanen, 2012; Lester et al., 2011).

2.3.7 Conclusions

My definition for online social interaction derives out of literature from sociology, communications and interaction design. I understand online social interaction as **happening in an environment where at least two people are connected through digital electronic means and can transfer data with the intention of wanting to interact with the other person in an understanding manner**. I further believe that a conscious act of using the means to do so precedes taking part in online social interaction.

The literature review further provides a historical summary on forms of online social interactions taking place via the Internet to current Web2.0[22] social media sites. The users of social media sites are predominately younger users. About 40% of people over 65 years are using the Internet daily. Email and accessing information are the most frequently reported activities. The trend is rising for the young old, but three quarters of people over 75 years of age have never accessed the Internet. The trend shows that increased numbers of older people take up the use of social media sites, but the uptake is very slow. In contrast to telephoning or making video calls (via webcam) over the Internet, the difference between younger user and older users is the least pronounced. Accessing the Internet from a mobile device (smartphone and tablets) is also on the increase. The barriers for older people to going online have also been presented. The greatest barrier to going online is the lack of a perceived benefit to do so.

The question whether Internet connectivity increases or decreases the number of social connection has been discussed. I concluded that online connectivity can support social connectivity, particularly when it is accessed through a safe space (a trusted

[21] One recent story published on the BBC news website described a 20 year old man who targeted 14-15 year old girls online for contact, asked them to undress for the webcam and after they complied, he threatened to publish indecent pictures of them if they didn't meet up with him for sex (BBC News 2011). This story is not only an example of how paedophiles have new ways of contacting children, but also an example how these girls underestimated their actions while being online and its consequences.

[22] During Web 0.0 the web was developed, with web 1.0 the development of shopping carts and the static websites was on the rise, web 2.0 can be called the writing and participating web, web 3.0 (we're not there yet) can be understood as the semantic executing web and web 4.0 as the open linked and intelligent web (the future) (Flat World Business, 2014).

website or service or in a trusted environment). The subsequent online interaction and connectivity with the person or site can be positive for psychological well-being.

Chapter 3

3 Research Methodology

This chapter discusses the concept of research relevant to design research. The historical context shows how design research has evolved from professional applied artistic, engineering and crafts activities to a more ubiquitous role of design shaping future societies. The theoretical perspective, constructive design as a meta-methodology and the approaches available are further discussed. Constructive design research underpinned my research journeys. The full detail, however, will be described in subsequent chapters.

3.1 What is research?

Kumar describes research as a way of answering questions where the following process is being applied (Kumar, 2011, p.5):

"1. [Research] is being undertaken within a framework of a set of philosophies;
2. [Research] uses procedures, methods and techniques that have been tested for their validity and reliability;
3. [Research] is designed to be unbiased and objective."

In my view he describes the process from a traditional social science perspective and where qualitative research needs to justify their approach to a larger canon of positivist research.

In 1995 Archer, researcher at the Royal College of Art at the time, described research as a *"systematic enquiry whose goal is communicable knowledge:*

- *systematic because it is pursued according to some plan;*
- *an enquiry because it is seeks to find answers to questions;*
- *goal-directed because the objects of the enquiry are posed by the task description;*
- *knowledge-directed because the findings of the enquiry must go beyond providing mere information; and*

- *communicable because the findings must be intelligible to, and located within some framework of understanding for, an appropriate audience." (Archer, 1995, p.6)*

His description, referring mainly to design research, does not employ terms such as validity, reliability, unbiased and objective anymore. Archer's description can be seen as underpinning Haseman's paradigm of performative research in order to support the methodological arguments in practice-led research (Hasemann, 2007). The word "Performative" has to be understood as a container word for all forms of practice in design and the creative arts research from poetry, pottery, games to paintings and performances. Haseman argues that performative researchers do not need to borrow 'scientific methods' from social sciences "*in order to meet rigorous requirements of validity, reliability and truth hunting*" (Hasemann, 2007, p.151).

Performative researchers engage in a range of mixed methods, which are instigated by and led by from the demands of their practice. In this respect practice-led research can be seen as a manifold and evolving research strategy, for which there is no template for the selection of methods that could be applied across disciplines and projects.

3.2 What is design research?

The notion of design research is open to many interpretations, which have produced many discussions (Binder & Redström, 2006). One could ask questions based on Frayling's categories for approaching design research (Frayling, 1993): is it research for design? Or research about design? Or research through design?

The research-through-design methodology has led to many debates and confusion for researchers (Bang, Krogh, Ludvigsen, & Markussen, 2012; Durling & Niedderer, 2007; Frankel & Racine, 2010; J. Zimmerman & Forlizzi, 2008), in particular with the question on how practical design research can contribute to theory construction.

The field of design research is relatively young in comparison to the more established fields in the natural sciences and social sciences. Despite its youth, the design research field is complex and multi-facetted (Blessing & Chakrabarti, 2009; Cross, 2007; Ken Friedman, 2000; Krippendorff, 2006; Simonsen & Robertson, 2013).

According to Wallace and Blessing (K. Wallace & Blessing, 2000) design research only started after WWII and had 3 overlapping phases: the experiential, intellectual and experimental.

- **The Experiential phase:** 1940s up to late 1950s. In this phase senior designers wrote about their experiences of the design process. The activity of designing at this point was still seen as a 'black box' where sudden mental insights appeared during the ideation process. There were no theoretical frameworks or specific philosophical theories for design domain such as graphic design or architecture. The activities were treated as applied work or aesthetical explorations.
- **The intellectual phase:** started in the 1960s and lasted about 20 years. During this time, Ulm's School for Kunst und Gestaltung was particularly leading in the debates (e.g. Webber and Rittel), attempts were made to provide a logical and consistent base for design. Many methodologies, principles and methods were proposed, but none proved to be suitable for all eventualities of design.
- **The empirical phase**: started in the 80s and gained momentum in the 90s. Many empirical studies were conducted to gather data in lab and practice to understand how design teams worked and what impact new tools and methods had on the design process.

According to Bannon and Ehn the field of design research grew out of the arts and craft movement at the beginning of the last century by "offering a collaborative *Gesamtkunstwerk*, a joining of art and technology" (Bannon & Ehn, 2013, p.40). Starting in 1919 with the Bauhaus movement there was the vision (in Europe) that social constructivism can take place by taking control with new forms of design and technology, which would lead to an improved future (Bayazit, 2004). With WWII this vision prematurely came to an end and after the war the discipline of design concentrated mainly on aesthetical explorations and its internal processes.

In my view, with the trend of integrating technology ubiquitously into our day-to-day activities (the third wave in HCI (Carroll, 2013)) it is appropriate from an ethical point of view to seek collaboration in order to design futures that are meaningful to people. With the collaborative approach, which ideally includes forms of democratic and empowering activities, the preferred state – the future - can be collectively discussed and reflected upon.

Most design research is applied research (K. Friedman, 2002). Very little research is about design research itself, which suggests that the research community is still in the process of defining design research in context to other (emerging) disciplines. A useful source for on-going discussions on and in the discipline can be found on the PHD design mailing list.

In design research there is no agreement on one particular use of methodology. Blessing and Chakrabarti lists 3 main issues, which stops the community from

establishing an overall theoretical framework for design research (Blessing & Chakrabarti, 2009, p.6):

- *"Firstly, there is no comprehensive overview of existing research, which makes the field fragmented, with too many loose strands of research and no agreement on terminology.*
- *Secondly, there is disconnection between academia and industry, which implies that results of research do not get adopted in practice.*
- *Thirdly, the lack of scientific rigour means that design research has not been able to establish itself on firm grounds."*

Whilst I agree with the first two points, I would like to qualify their last point. It has to be considered from their engineering design perspective, where in their view design research has to become more effective and efficient and specific outcomes are likely to be successful products or tools for the design process. They expect design processes to be repeatable, whilst achieving measureable outcomes. From my point of view it would be ill conceived to attempt making all design research processes and outcomes comparable and measurable. I believe that this is an infinite task due to the complex and unpredictable nature of design research, particularly when dealing with societal concerns and facilitating change. However, I do believe in the in the explorative nature of research and in the value of examples and principles in design research.

Redström and Binder promote a pragmatist perspective based on design experiments. In their view design research is:

> *"a venue for knowledge production that is guided by the professional interests of design communities and the need for theoretical and methodological development. Such research may be conducted by designers as part of their work, or it may be led by academic institutions aiming at expanding our knowledge of 'what' can be designed and 'how' designing can be done."*
> (Binder & Redström, 2006, p.2)

I subscribe to the pragmatist perspective (Binder & Redström, 2006; Myers & Baskerville, 2004), where emphasis is placed on the making and doing as a way of creating knowledge and improving situations rather than observing, theorizing and categorising 'life'.

Next, I'm going to describe the interventionist research strategy for exemplary design research (Bang et al., 2012; Binder & Redström, 2006; Brandt & Binder, 2007), which forms the philosophical foundations for the meta-methodology labelled constructive design research (CDR) (Koskinen et al., 2011).

3.3 Exemplary design research

Exemplary design research is an interventionist research strategy driven by programs and experiments (Binder & Redström, 2006). The explicit formulation of the research program acts as a frame for carrying out the interventions or experiments, upon which the researcher reflects.

> *"Experimental work is not limited to be the construction of prototypes or artefacts but also means the evaluation or exposure of these in the context they are developed for" (Bang et al., 2012, p.7).*

The dialectical relationship between program and experiment is a key component in this research strategy. The experiments attempt to answer the questions or suggestions put forward by the program. The term experiment has to be understood in the widest sense and should not be interpreted as strict laboratory or psychological experiments where in constraint settings hypotheses are tested. A discussion on the terms design experiment, exploration or intervention is provided in Chapter 3.4.1.

With exemplary design research it is important to emphasise that the **combination** of program and experiments address the underlying research questions, not the experiment alone.

In experimental design research all research questions ask in effect for more than the experiment (or intervention) is able to provide an answer to - see figure 9 (Brandt & Binder, 2007, p.5).

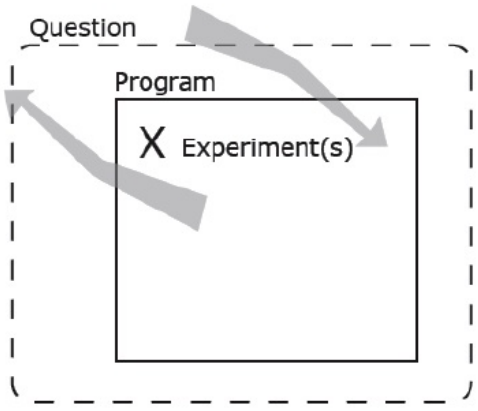


Figure 9: Brandt & Binder's diagram for the relationship between question, program and experiment

An open question initially influences the framing of the program. A program typically defines an area of exploration and sets goals for what is to be achieved by the design. Design experiment(s) are a means to explore a possible program. At the

same time an experiment might influence the program and can eventually sharpen or re-shape the research question (Brandt & Binder, 2007). The design researcher needs to be critical and reflective of the program, not just of the experiments, in order to extract knowledge as contribution for peers (Binder & Redström, 2006).

With the reflections after each design journey, I will demonstrate how I have stayed reflective of the research program and experiments or interventions. For example, after my first design journey I made the decision to re-frame my design space, which effectively widened the research program and changed the type of experiments and interventions. I felt that my overall research question of "how do I design online social interaction *for and with* older people" was better answered by exploring options outside a pure web interface and by considering computer novices in the *age of fulfilment* (Laslett, 1996).

3.4 Constructive design research – a meta-methodology

Koskinen, Binder, Wensveen, Zimmerman and Redström published a book in 2011 titled: "Design research through practice, from the lab, field and showroom" (Koskinen et al., 2011) in order to move away from Frayling's categories and to promote constructive design research (CDR) as a new label. CDR builds on exemplary design research philosophically and was introduced as a new way of looking at design research methodology, which involves the imagination and construction of an artefact.

The artefact can be anything built or conceptually externalised starting from a prototype, system, space, product, service, and which then gets employed in some form of intervention, experiment or evaluation (crit / exhibition).

CDR has its roots in engineering, social sciences and art & design. It divides 3 places of research: the lab, the field and the showroom – see figure 10.

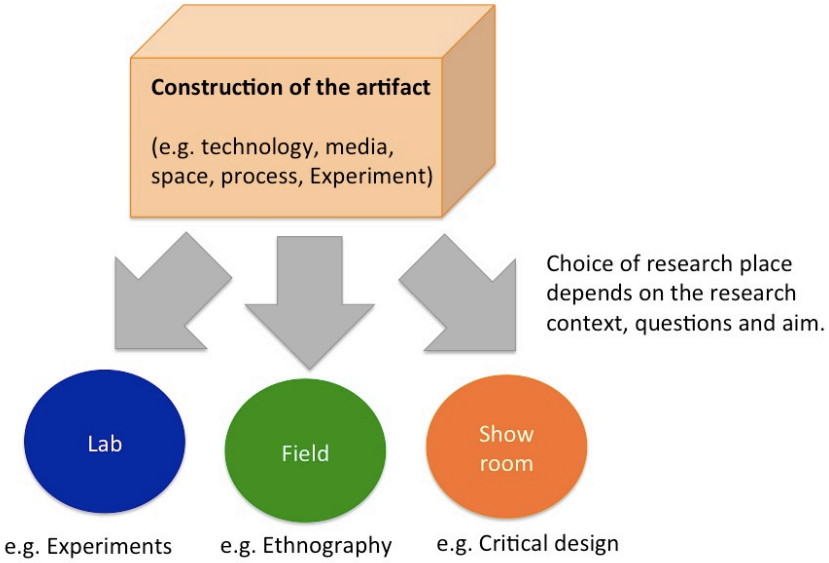


Figure 10: Model of Constructive Design Research (CDR)'s places of research

CDR incorporates any previous 'research through design' projects[23] under its umbrella. Small research projects, but also large research programs with multi-disciplinary teams can apply CDR as research methodology (for example *ifloor* (M Ludvigsen, 2006), the *Presence project* (Hooker & Kitchen, 2014)).

Constructive design researchers follow the steps aligned to those used in Action Research of iteratively planning, acting (i.e. producing a prototype, concept, scenario), observing and reflecting whilst drawing from interdisciplinary knowledge (Basaballe & Halskov, 2012; Koskinen et al., 2011).

Zimmerman and Forlizzi have explored in the conditions for CDR projects to be started (J. Zimmerman & Forlizzi, 2008). In their view CDR can start from two places: the "philosophical" and the "grounded approach". With the first approach the formulation of a research question derives out of an existing theory or philosophy, and which in turn is investigated through a process of making and designing. With the grounded approach researchers focus on real-world problems by making things, which have to be seen as a proposition for the preferred state to be agreed upon by the stakeholders (J. Zimmerman & Forlizzi, 2008) – which brings home that design is a social process (Binder et al., 2012).

[23] Some researchers have not adopted the new label "CDR" yet and may continue to use 'research through design' to describe the methodology for their research. Whilst 'research through design' constitutes CDR, CDR can be seen as more encompassing and flexible as a meta-methodology based on engineering, social sciences and design traditions.

Bang et al. introduced a diagram (Bang et al., 2012) expanding on the influences at play during CDR. With the diagram they demonstrate the interconnectedness and recursive nature of aspects during CDR.

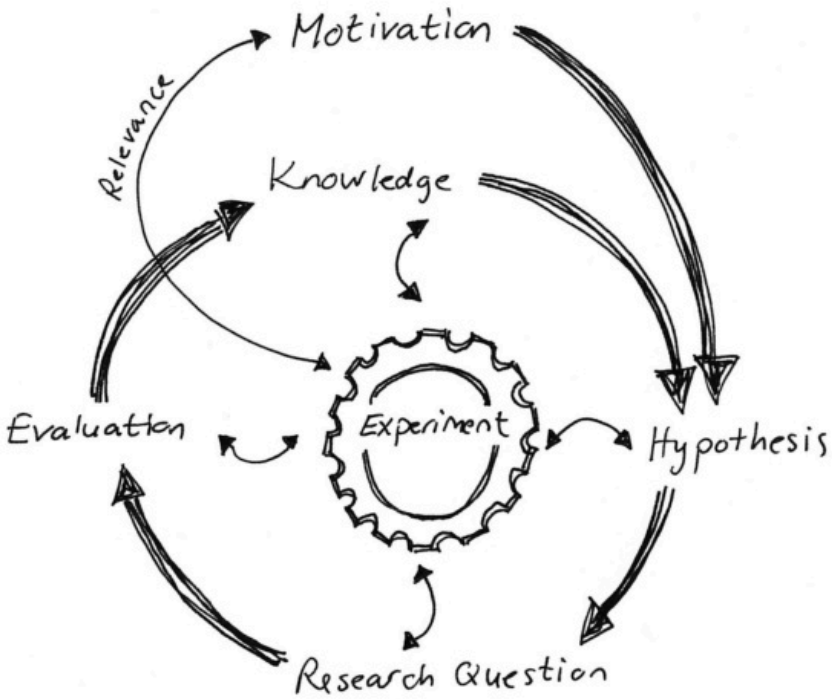


Figure 11: Bang et al.'s diagram for CDR

According to Bang et al. the experiment (or intervention as discussed in Chapter 3.4.1) is a cogwheel, which drives constructive design research forward. The experiment can inform (and be informed by) every level in the research process. In Bang et al.'s view there is an initial hierarchy in CDR. Every project starts with a clear motivation. From this motivation, researchers take steps to work with a hypothesis (which may be only implicit or tacitly expressed in the experiment) in order to address research questions and develop a position to evaluate the experiment. Bang et al. reviewed 6 well-discussed CDR PhD theses in regards to the researchers' motivation. From these they extracted 6 motivational contexts (which is not a complete number, but a starting point) and argue that out of combination or tensions between those motivational contexts, the research was initiated.

For example, they argue that Niedderer's PhD research was initiated by a practice based / artistically inclined approach combined with an empirical approach. Niedderer used her practice to explore through experiments the concept of performative objects. Trotto with her PhD in design activism had her motivational context placed in a combination of ethical and political motivations.

They further state that a theoretical position is rarely the starting point, but it is brought into the research by the researcher "a way to qualify and distinguish aspects in the

experimental process" (Bang et al., 2012, p.9). In my view this is when the researcher develops their theoretical framework.

Bang et al. offer this model (where they emphasise that there is no linearity to it apart from the motivational context) to aid researchers to understand at what level discussions and claims can be brought forward, so that the contributions to research can become communicable and meaningful to other researchers.

Applying Bang et al.'s motivational contexts to my research was not straightforward. Using their terms I would describe my research as mainly deriving from a practice / artistically inclined approach (i.e. my experience in user research and design). This combined with a technologically provoked and ethical approach implied that I had three motivational contexts at play instead of Bang et al.'s proposed two.

I present a modification to Bang et al.'s model in Chapter 9.10 and the visual development of my thinking in appendix 2.1.

3.4.1 Design experiments, exploration or interventions

In regards to CDR some terminology is still going through the process of change and adoption by the various research communities. Whilst in the Nordic countries the term "design experiment" has been coined to imply a range of activities that involve constructs by design researchers, the term "experiment" itself carries heavy pre-conceptions of men in white coats, measuring and observing things in constraint settings in order to achieve a definite answer to a hypothesis. However, design experiments, in the Nordic sense, can vary from design activities for reflection (Hallnäs & Redström, 2001), to artefacts that are used in public settings to gather direct reactions from audiences (Lee & Bichard, 2008; Martin Ludvigsen & Veerasawmy, 2010). Considering that interaction design and HCI are research communities of communities where heavy influences from psychology and computer science prevail, the term "experiment" might cause a misunderstanding.
The terms "design intervention" or "design exploration" might be more suitable. Given design research's interest in applying real world change (or to intervene in an existing situation to change it into a preferred one), it is in alignment with action research and the term intervention might be more appropriate. However, action research aims to evaluate the impact achieved with an intervention (Kock, 2013), but design interventions do not claim to have this focus.
"Design exploration" as term describes very much the characteristics of CDR, but literature review shows that this term has a wide meaning, which can produce an ineffective search. Through my search I found that a significant amount of literature uses

a co-design approach to design explorations (see for example: Boer & Donovan, 2012; Brandt, 2006; Subasi, 2013) or it focuses on material design explorations, where interventions or experiments involving everyday situations or in-the-wild settings are not included (see for example (Kimman et al., 2011) – here experts are used to review the artefact).

Since HCI and design, interaction design had recently strong influences from the social sciences, sociology and anthropology in particular, where the term intervention is more common than experiments (Carroll & Rosson, 2013), I have decided to continue with the term "design intervention" when I engage audiences with my construction. I will use the term experiment when I describe the construction of my prototypes in reference to the Redström and Binder's exemplary design research model.

3.4.2 CDR contributions and places of research

The contributions to knowledge have to be seen as a malleable construct in CDR. They cannot be measured in the same way as 'contributions' in natural sciences. The constructed artefacts externalise the design researchers' knowledge. When researchers conduct experiments or interventions with their constructed artefacts[24], they may generate knowledge about design techniques, processes, how people interpreted the designed artefacts and how people appropriated them. Design researchers develop frameworks in order to explain their choices and thinking for the design such as Battarbee's co-experience (Battarbee, 2003) and Djajadiningrat et al.'s tangible interaction (Djajadiningrat, Wensveen, Frens, & Overbeeke, 2004)), which form a major part of their contributions. However, some CDR researchers may not develop a full framework, but seek to raise debate and reflection (e.g. critical design).

> *"Constructive design research probes an imagined world, not the real world of a social scientist. Although things that are often playful and sometimes disturbing populate it, it is a very useful world. It makes it possible to study things outside normal experience" (Koskinen et al., 2011, p.168).*

3.4.3 The Lab as a place of research

Typically, technical universities such as Eindhoven and Delft conduct CDR in the lab. One example is the investigation into emotionally rich interaction design by Wensveen et al. (Wensveen, Overbeeke, & Djajadiningrat, 2002), for which Wensveen designed an alarm clock involving affective reactions. In the lab approach

[24] The construction of the artefact is understood as an experiment.

design research takes place by building the artefact and testing it in laboratory-like conditions. The design is understood through experiments and statistics (Koskinen & Lee, 2009). Wensveen's contributions are his framework, artefacts and outcomes from the experiments.

3.4.4 The field as a place of research

CDR in the field borrows methods from ethnographical research and builds on the interpretivist paradigm, where meaning is constructed in the social process (Koskinen & Lee, 2009). Research examples are Villa Rosario (Koskinen et al., 2011), Maypole (J. Zimmerman, Stolterman, & Forlizzi, 2010) and the ludic engagement of elderly people in 'Jacob House' (Blythe et al., 2010). The first example employed ethnographic methods and cultural probes to understand the conditions in Vila Rosario, a former slum area 15 km north of Rio de Janeiro, in order to inform designs that helped improving public health. The latter two examples involve ethnographical methods, participatory design activities and the construction of prototypes / artefacts in order to receive feedback. "The field" as a research area can also be understood or argued for as "empathic design" (Forlizzi & Battarbee, 2004; Koskinen, Battarbee, & Mattelmaki, 2003) from the interaction design perspective (see Chapter 4.1.2 for further explanation on the empathic approach) .

3.4.5 The showroom as a place of research

The *showroom* approach, previously labelled "gallery" (Koskinen, Binder, & Redström, 2008), builds on inspirations and borrows metaphors & techniques from the art world and aims to create discussion, debate and an impulse to re-think current norms and structures. Research is displayed in shop windows, exhibitions and galleries reaching audiences who are not reading design research books or conference papers. The most well-known examples of "*making art as the basis of design research*" (Koskinen & Lee, 2009, p.2779) derive from the Royal College of Art at the end of the last century. Dunne and Raby (Dunne & Raby, 2001) developed the *Critical design* approach, where they challenged the viewers' perceptions with provocative artistic interventions in order to stimulate a discourse around conceptions of technology & design.

The *showroom* approach has been anti-scientific from its roots. It was a response to the over-domineering lab style approach in design. Being suspicious of concepts such as 'theory' and 'facts', inspiration-orientated design researchers introduced lingo such as "returns", "tactics", "gossip" and "design proposals" to replace words such as data, systematic analysis and conclusions (B. Gaver, Dunne, & Pacenti, 1999;

Koskinen & Lee, 2009). In-line with the anti-scientific ethos of this tradition, there is no feasible way to assess whether the outcomes of this approach are better than the outcomes of other approaches (Koskinen & Lee, 2009).

The *showroom approach* appears to be the least academically developed approach because not much literature can be found under this label. The absence of literature and the novel label may lead to confusion in how to interpret the approach.

Koskinen et al. offer 3 tactics in order to avoid being misinterpreted as an artist rather than a design researcher (Koskinen et al., 2011, p.98).

The first tactic is to take the discourse into the real world i.e. to address societal issues with design and to be as designer part of the discourse where the meaning of the work is discussed. According to the authors, the challenge will be to take the debate or discourse to places where it matters. My last design journey, the co-design journey, will demonstrate how I took the debate around designing online social interaction to people where it mattered (see Chapter 8 and appendix 6).

The second tactic is to design to a high professional standard. With this the researcher aims to reach other professional designers' attention, and to be taken seriously as a designer.

I did not consider this tactic as the most appropriate one for my research since I was more interested in the concepts and in a working prototype rather than a 'polished' outcome.

The final tactic would be to study prototypes in real life, which I did in my 2nd and 3rd design journey (see Chapters 6 and 7).

3.5 Critique of CDR

CDR, due to its infancy, has not yet been fully established in the design research community. The community has still to find agreements in regards to capturing design development and experiments, decision points and how to draw out research contributions. The lack of a large body of widely discussed and representative CDR projects, is likely to lead to variations in interpretations on how to perform CDR. At the same time confusion around 'Research through Design' as methodology and as previous label for CDR projects remains. There have been calls to make the CDR more formalised (Basaballe & Halskov, 2012; J. Zimmerman et al., 2010), but also views on keeping the research approach on general terms since the situational 'project' or research context is always different (Bang et al., 2012). For example, Gaver calls for a less structured approach and to concentrate only on the main

characteristic of CDR such as starting point, documenting the design process, artefact and consequences. Gaver and Bowers advocate the use of annotated portfolio to portray and document the design process and to take this as a form of theory (B. Gaver & Bowers, 2012).

Although Bang et al. support the methodological flexibility of CDR they would like to see a more clearly articulated bridge between the actual activity of designing and the "science of the imaginary" (Koskinen et al., 2011, p.42). They advocate looking at the motivational contexts, which initiated the design research, in order to develop training materials to guide design researchers (Bang et al., 2012).

In my view it depends on the design context whether more or less structured in the design process can or shall be applied. Assuming the design research concentrates on improved efficiency and effectiveness of a product or service, (this type of design research I call loosely "engineering"), then a more structured design process is feasible. In comparison to dialogue-orientated design research, where emphasis is placed on gaining insights, the process and reflections, then it will be necessary to allow for freedom and exploration.

Another critique of CDR is that I found the distinction between field and showroom as places of research to be fuzzy. In my view they don't work as metaphors for research places, but I haven't got better labels to offer for now. In my understanding the main distinction between field and showroom is how design researchers capture their own assumptions versus people's assumptions. With this I mean whether a design researcher learns first from the target audience and the context before designing (similar to field), or whether the design researcher puts something together to express their thinking based on inspirations & insights and then get people to reflect on it (similarly to showroom, but also probes, toolkits, and participatory prototyping). At the same time, since I perceive designing as a journey and an iterative process, it may be easy to establish at the beginning of the journey who's assumptions are being captured, but the further the process develops the designed artefact is likely to be an outcome of the social process externalising digested ideas.

Overall, I chose to work with CDR as a meta-methodology since it provided the flexibility to re-frame my research program and to continue exploring the main research question in different ways. CDR can be combined with other research approaches such as inclusive design and participatory design without generating epistemological conflicts.

3.5.1 Conclusions

This chapter discussed the notion of research and historical phases in the field of design research. The field of design research is complex, multi-layered and fragmented and an agreed overall methodology is lacking. I introduced the philosophical foundations for CDR as a meta-methodology where emphasis is placed on the construction and experimentation in the widest sense. The recursive diagram by Bang et al. demonstrates the interconnected and cyclic nature of experimental design research, where the experiment (artefact, intervention, space etc.) drives forward the considerations in the design research process.

CDR places of research were discussed by providing examples. The showroom as an approach has been presented in more detail since it is an approach adopted for my research. Although CDR is not without criticism, I decided to adopt this methodological approach as it provided me with the freedom for exploration of the expected unexpected (which the topic of social interaction and older people will inevitably bring along). CDR caters for shifts in the design space without creating tensions in the process due to its recursive and reflective nature.

Chapter 4

4 Methodological approaches in my design journeys

In this chapter the methodological approaches for my 4 design journeys are described.

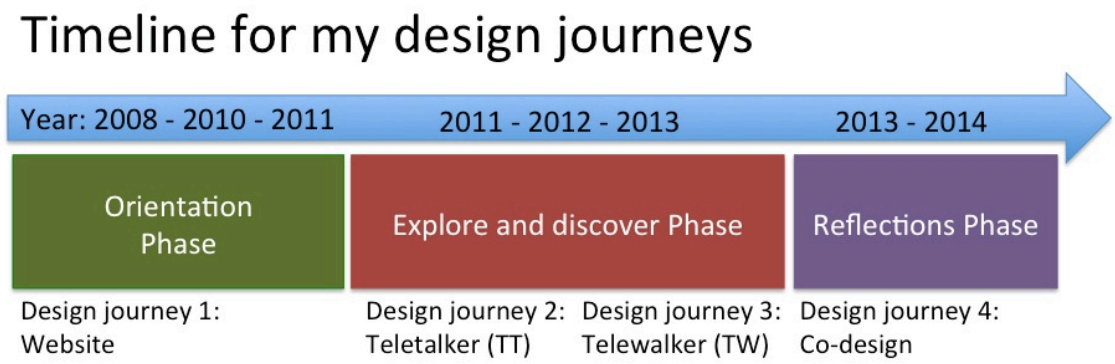


Figure 12: Timeline and phases for my PhD research journey

In the **orientation phase** from 2008 to 2011 I started wide with my research in order to orientate myself about the current state of older people using online social media and about the technological possibilities. I followed a user-centred iterative design approach where I immersed myself into understanding the target audience and their context whilst developing possible design ideas for a website. I conducted storytelling workshops to empower older users in the development of the design brief.

After the first journey's reflections phase, I reframed my design space and continued with the **explore and discover phase** (2011-2013). Using CDR as meta-methodological approach I built the TT – an online video presence system, which was my first design experiment. Three rounds of design interventions in natural settings were conducted to capture returns on the design for social interaction.

Due to the real world interventions the opportunity arose to adapt the TT for care home use. Following a design brief set by care home management, the TW design journey was an emphatic and collaborative product design journey. The TW was built as the first design experiment, whilst trust was built up with residents and video technology was slowly introduced. Due to circumstances the TW could not be tried out in the care home setting, but was evaluated with one intervention at Age UK.

In the **reflections phase** specifically selected stakeholders, including older people, took part in a reflective co-design workshop where they negotiated future concepts for online connectivity considering the capabilities and contexts for older people. The artefacts, the returns and insights gathered from the previous experiments (and design journeys) formed the foundations for the showroom narrative, which was used to inspire stakeholders for the *make* workshop of future technologies.

4.1 Approach for 1. Design journey: website

The following describes the anticipated design process with the first design journey, the approach to requirements collection and the intention of empowering the user during the design process. It further highlights the importance of time for reflection as a way of learning and developing new perspectives.

4.1.1 The anticipated design process

At the beginning of my PhD research in 2008 and even after the PhD registration in 2009 I had not settled on designing a website. I had the intention to keep an open mind about which technological platform might have been most suitable to address the design of online social interaction for older people. The only aspect I knew for certain at the beginning of the PhD journey was my desire to design something tangible. This was due to my conviction that *making* is a useful way of gaining and contributing to knowledge (Binder et al., 2012).

Any design process consists of a minimum of two phases, which are also the two phases in creative problem solving (Koberg & Bagnall, 2003; Margolin, 1996):

1. The analysis of the situation and the problem
2. The realisation of a solution

Further literature in design education suggests that the design process can be divided in more phases. Hanington describes the process with 3 phases, namely: explore, generate, evaluate (B. M. Hanington, 2007). Over 30 years ago Jones also designated 3 phases: define, synthesise, evaluate (Jones, 1980). More recently the UK design council used the double diamond diagram to demonstrate divergence and convergence in the design process (Design Council, 2005). Pugh, from a product design and engineering perspective, offers a 6 step diagram for the total design of a product (Pugh, 1991). All of these diagrams have in common that the phases or steps relate iteratively and influence each other.

The following diagram illustrates my intended design process in 2009:

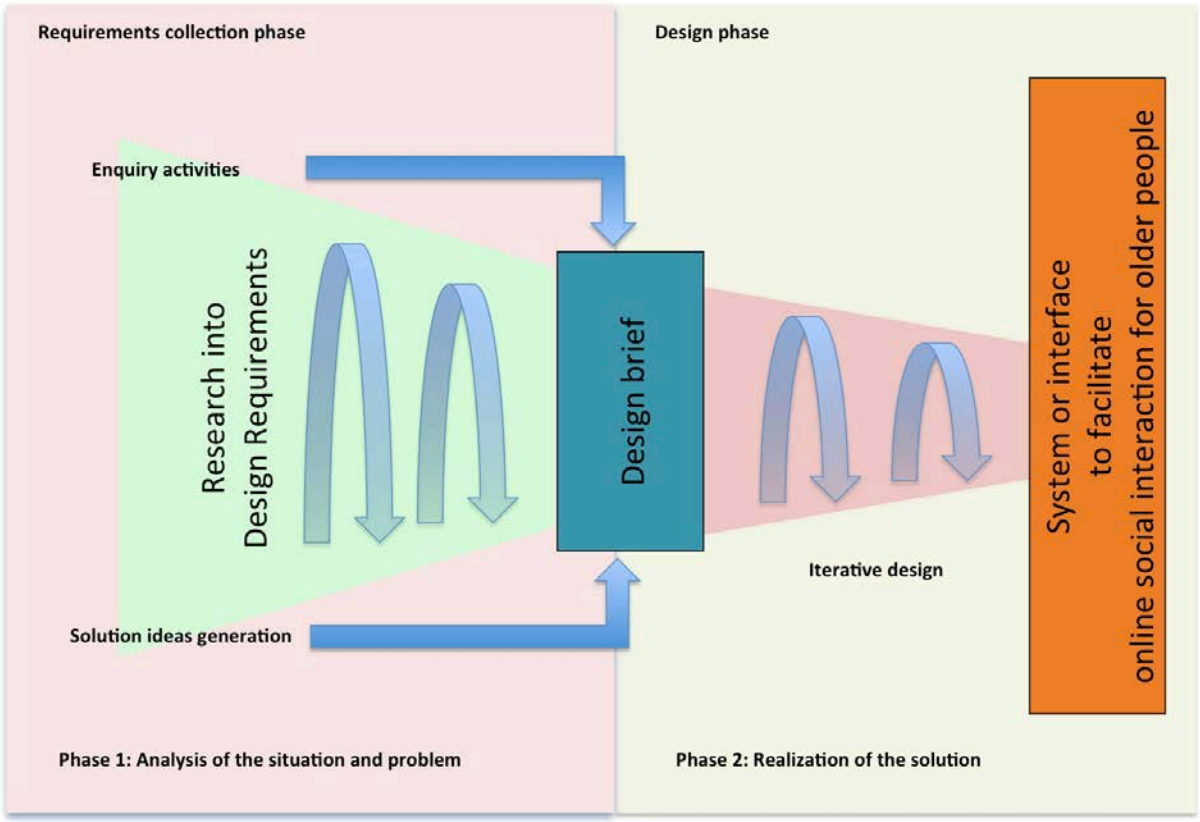


Figure 13: Model of my envisaged design process

The investigations into the problem and having ideas for solutions (the left side of the diagram) have a dialectical relationship and influence each other. For this I adopted the 'problem-solve by synthesis' design strategy (Cross, 2007). The design phase, starting from the design brief, shows how the design process is convergent and the artefact is refined with iterations into one proposed system or interface. In this phase I expected to have built my solution and tried out with potential users until I reached a satisfying product (or outcome) for answering the design brief.

4.1.2 An empathetic approach for information gathering

This iterative design approach was familiar to me since I was exposed to it through IT development projects in my commercial professional life[25]. In commercial research activities I used to emphasize the importance of user-centred design (Preece, 2007) in order to achieve sociotechnical outcomes that consider the "end user"[26]. The EU and W3C consortium have been promoting *inclusive design* as the main design

[25] For example, I was involved in designing a touch screen check out system for Sainsbury's. For this, the existing till system had to be analyzed and existing work practices understood in order to translate the knowledge as requirements for the design of the touch screen system.

[26] The "end user" or "the user" are problematic terms (Krippendorff, 2005; E. B. Sanders & Stappers, 2008; John Vines et al., 2013) since these terms suggest a definite type of person. In reality there is whole range of users of a system who have different abilities (mental, physical) and working in different. However, I continue to use the term "user" to signify the concept of 'a person' who will be using the system.

approach for products and services addressing the majority of the population (ANEC, 2014a; W3C Web Accessibility Initiative, 2014). In my design journey description I will refer to an initial review on this topic in appendix 3.1 – 3.1.5.

My intention was to build on these approaches and I wanted to go one step further. I wanted to immerse myself in the world of the target audience in order to design with empathy (Koskinen, Battarbee, et al., 2003). Empathy needs to be understood as "*an imaginative projection into another person's situation*" considering emotional and motivational aspects (ibid., p.45). There is a large body of literature regarding empathy and user research in HCI and design research (Buchenau & Suri, 2000; Koskinen, Mattelmaki, & Battarbee, 2003; Kouprie & Visser, 2009; Mattelmäki & Battarbee, 2002; Suri, 2003; Wright & McCarthy, 2008). Terms such as "knowing the user", "walking in their shoes" are being used to describe the empathetic approach (Kouprie & Visser, 2009). Literature suggests that empathy depends on the personal capability of the design researcher to be able to identify oneself with the feelings and circumstances of another person (ibid.).

Empathy can be achieved through different forms of media and relations. The closest approach to the target audience and their experience is the dialogical approach, where a direct connection between researcher and observant is created. From this starting point fall approaches such as ethnography and other field work approaches, probes and exploratory games (Wright & McCarthy, 2008). Another way to achieve empathy can be found through deriving narratives. This approach uses narratives to create an understanding of the felt experience such as ethnographic vignettes and scenario based design, where the characters or personas convey their feelings, attitudes and motivations. A third approach to create empathy can be through the "imagined other" with activities such as role-playing, enactments or autobiographical work. An important aspect to understand about the empathic approach is that it is not about the designer becoming the user to understand them, but that the designer remains in a position where they can add from their perspective (Wright & McCarthy, 2008).

Van Rijn et al conducted a small piece of research comparing the 3 different empathetic approaches with groups of design students designing an artefact for autistic children (Van Rijn, Sleeswijk Visser, Stappers, & Deniz Ozakar, 2011). They found that the group working with children directly achieved the most relevant and applicable outcomes. The two groups, which had video as an information source had two very contrasting outcome (one useful, one not), which supports the view that it depends on the willingness and motivation of the designers to design with empathy (ibid.).

Suri describes 4 classes of information a designer can access ranging from more objective to subjective sources (Suri 2003, p.43ff):

- *Learning from data, whether secondary source or our own analysis*
- *Looking at people in context*
- *Asking people to participate*
- *Trying things ourselves*

I considered accessing more than one class of information as important in order to gain a balanced view, preferably accessing all 4 classes.

As I will describe in Chapter 5.1 and appendix 3.2 with my design journey I used a range of methods to interact with the potential target audience such as guided interviews, observations of a computer class and forms of *contextual inquiry* (Holtzblatt & Beyer, 2013).

4.1.3 Empowering older users

Applying user-centred or human-centred approaches still left me unsatisfied in regards to giving older people a voice to influence the design process. In my view it is a person's right to be involved in the design of a system or technology when it is intended for them and their use (Simonsen & Robertson, 2013). I was exploring options for participatory or collaborative design (Schuler & Namioka, 1993), but realised that planning and conducting a full cycle of co-design with older participants was practically not feasible due to enormous variations in individual circumstances, the time demands and the level of unpredictability in an older person's life (in particular health issues). Hence, I settled for one participatory activity, a storytelling workshop, in order to inform the design brief. In my design journey description in Chapter 5.3.2 I will provide references to the literature that I reviewed in order to make this decision.

The content and outcomes of the storytelling workshops had influence on how the research journey moved forward, but not necessarily in a way that I had anticipated.

In the design journey description (see Chapter 5) I will also summarise the outcomes of reviews of websites, and systems I conducted as well as my ideation process.

The diagram below provides an overview of the early and main research activities before the design brief was supposed to be developed.

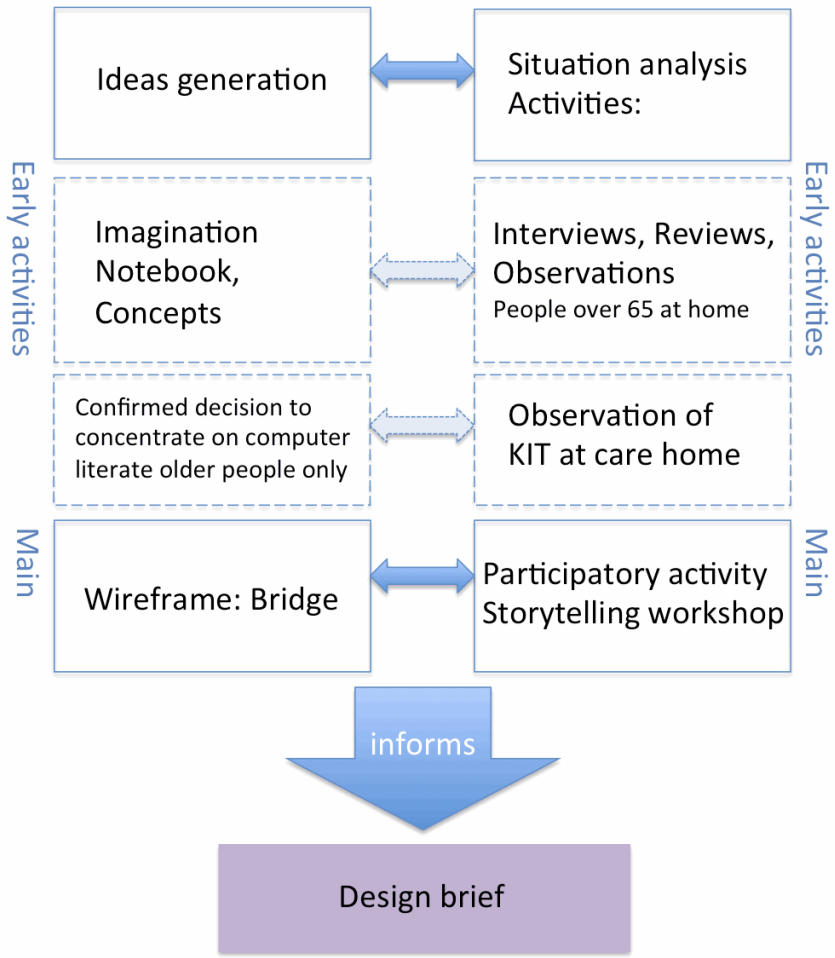


Figure 14: Model of the flow of research activities in the first design journey

4.1.4 On-going reflections and time for reflection

In my view, it needs to be emphasised that the act of reflection is important in order to gain insights and to learn, as suggested in Kolb's learning cycle (Kolb, 1984), in comparison to experiencing events undigested. According to Schoen experts have the ability to reflect-in-action due to their immense experience in the subject matter (Schoen, 1991). A designer will have a notebook or sketch book to work and reflect on ideas. As for myself I have experience in user research and data collection due to my commerical experience and certainly applied the reflection-in-action during data collection. However, due to the maternity leave (which took place shortly after the storytelling workshops) I had an extended period to reflect on my research activities. This additional reflection time allowed me to review observations and to make new connections for thoughts I had previously not done. This revealed additional insights and allowed intuition to emerge. This reflective process is described in the holistic model of reflecting experientially (Boud, Keogh, & Walker, 1995), which promotes

looking at the behaviour, ideas and feelings one had during the 'learning experience' in order to gain new perspectives or a change in behaviour.

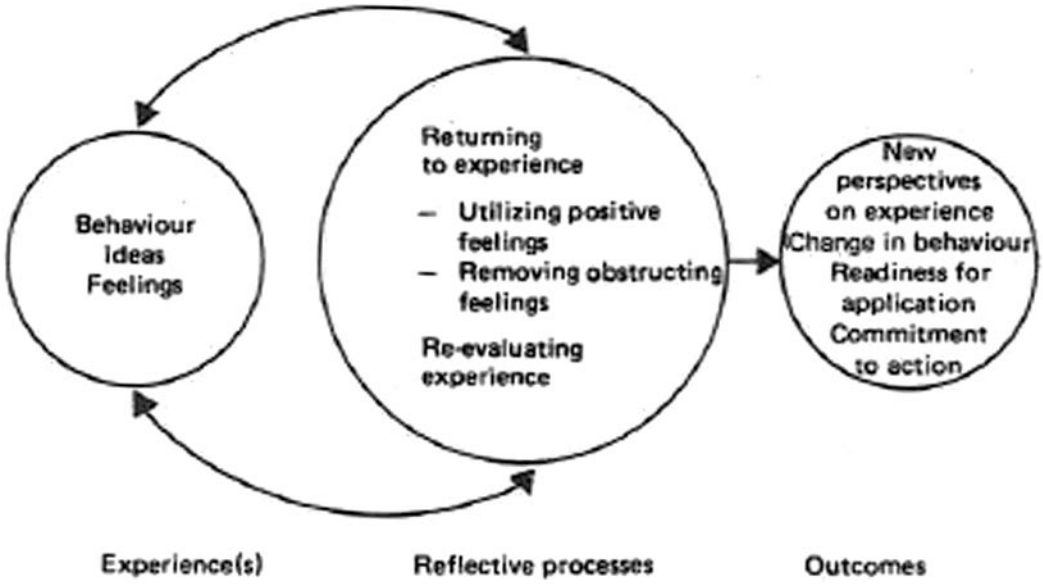


Figure 15: Reflections diagram by Boud, Keogh and Walker

The example of a 'patronising' website for older people, my the care home visit, as well as observing my daughter interacting with the world, were especially influential on my feelings and ideas. Following my intuition and a new perspective on where to focus the research activities, I decided to re-frame the design space by developing a new program for my design research, which focussed on online video connectivity and older novice users. Considering Wallas' phases for creativity I labelled this extended time for reflection the incubation and illumination period (Wallas, 1927) because during this time the idea for the TT emerged.

The full description of the website design journey, including the insights gained during the incubation period, can be found in the design journey description in Chapter 5.

4.2 Approach for 2. Design journey: the TT

The following section details how the anticipated design process changed with the second design journey, by focussing on the process rather than one outcome, and by making an artefact for intervention and debate instead. Interventionist design research by deploying the prototype in natural and social settings is key to study social interaction between people and around the artefact. I finally argue that the data collected during my in-the-wild interventions is not scientific, but has to be interpreted from the situated and embodied perspective and therefore I label these observations as "returns".

4.2.1 The design process revisited

After the incubation period and the decision to re-frame the design space, I continued with the making (or the construction) of the artefact rather than investigating further empirically with potential users the idea. I decided to work with the form and shape of the TV as an analogy, to build two kiosks that connected two spaces audio-visually, in order to demonstrate the benefits of online connectivity. I called this system the Teletalker (TT).

With this thinking my design process changed. Instead of focussing on a product or systems-based outcome, the focus shifted to the design process as a process of learning and exchange, where I conducted interventions with my artefacts and to offer the outcomes (returns, insights, narratives, examples, designed artefacts) as proposition for debate. Influences from developments in the HCI and Interaction Design communities steered me to take the TT into-the-wild.

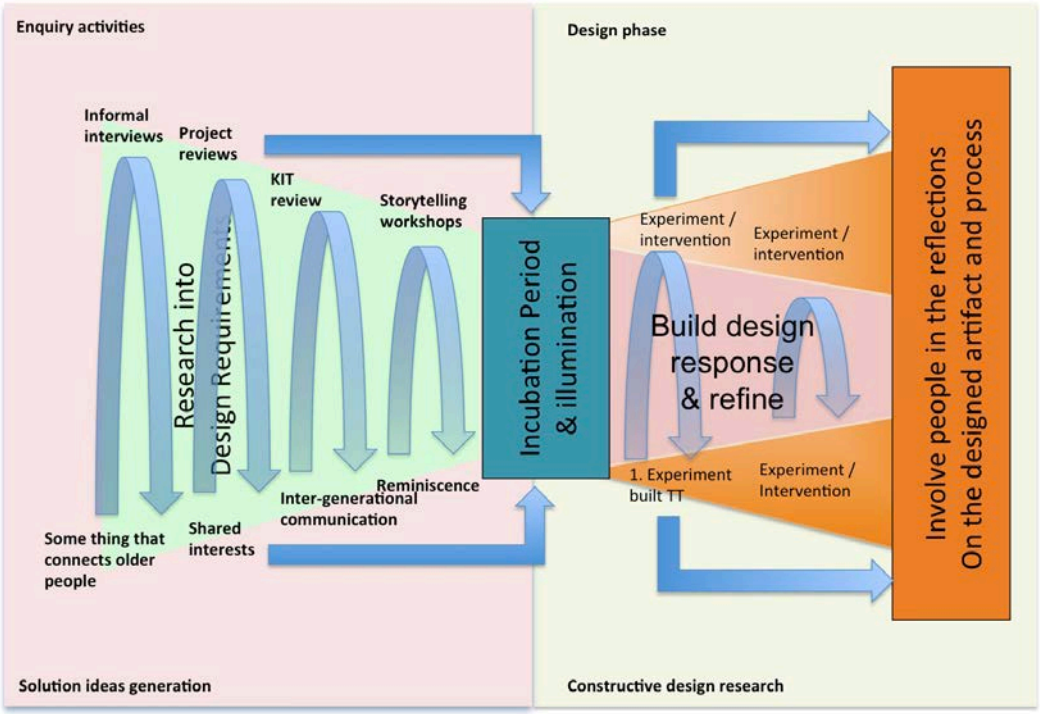


Figure 16: Model of the new design process

In this model the design brief has been replaced with the incubation & illumination period. There is still a converging cone for the iteratively designed artefact (i.e. the pink cone), but there is a widening orange cone around the small pink one. The widening orange cone demonstrates the involvement by other people in the design process and leading to a final collective reflection activity (the large orange rectangle) producing discussion, debate and potentially consensus[27].

4.2.2 Experimental design research

By building the TT, my first experiment, I designed my vision of a live online video system that aimed at demonstrating the benefits of online connectivity to any older computer novice and user. I designed the TT prototype as a research vehicle in order to conduct interventions with the potential user group, but the potential locations still had to be confirmed. In this respect I was intentionally general about the user group; I was considering places where older people gathered and to connect this to a place of interest where people of any age might go. The TV like concept of the TT was supposed to be age neutral and usable by anyone (teenager

[27] At the time I labeled the orange rectangle as activity to create a discourse on the role and form of online social interaction for older people. This was done based on references to critical design. However, since my research was not critical design, but design research borrowing from the showroom and field, the word discourse became inappropriate since I did not have the same conditions of an established community to further the academic discourse.

to adult). The specific mechanism to control the volume was chosen with the strength and ability of an older person in mind.

Figure 17: The TT kiosk during the first public intervention on 12th June 2012

As later described in the design journey in Chapter 6, during the making process I had to decide on trade-offs in regards to what was originally imagined and what was possible.

Overall, the second design journey can be characterised as designer-led from the start, but it aimed to finish with a collaborative activity to encourage discussion and reflection. At the time (in 2011) I was not able to describe how I would design the final collaborative activity, because this depended on how the following cycles of experimentation and intervention would turn out.

4.2.3 Placing the TT in-the-wild

With the rise of ubiquitous computing it has been common in the fields of interaction design and HCI to try out the prototypes with users not only in lab settings, but also in natural and real world settings. In the fields of HCI and Interaction design the expression “in-the-wild” has been introduced to conduct research where new systems were tested with users “in relatively unconstrained settings outside of the laboratory” (B. Brown, Reeves, & Sherwood, 2011). The advantages of “in-the-wild” research can be described as considering diverse settings of use and paying attention to the ‘unanticipated use’, which may come along with the users’ natural settings i.e. something that would not be discovered in a lab (Robson, 2011). There are also disadvantages of conducting research in-the-wild such as greater constraints on resources (equipment, people, space), time intensiveness, a degree of uncontrollability, inconsistency in research reporting formats and concerns around the aftermath of the research intervention (Taylor, Cheverst, Wright, & Olivier, 2013).

Despite the disadvantages, it was key to the concept of the TT to have the kiosks tried out by older people in a public setting or at least in a setting where older people usually come to and feel comfortable (rather than coming to the small usability lab at Middlesex university). The places that were connected played an important role in the TT concept and to study social interaction (Kurvinen, Koskinen, & Battarbee, 2008). The view generated through the TT kiosk was to be curiosity evoking and the simplicity of the design was to demonstrate the benefits of online connectivity when connecting different locations. If I had connected a lab to a lab with the TT and invited older people to try it out, I could have established the ease of use of the hand mechanism but would have not gained an understanding on the attractiveness of having a view and a volume interaction mechanism into another public place. The TT was my vehicle to learn more about older and younger people, their surroundings and how they interacted with it. The information I gained from the interventions was rich and multi-layered as well as context dependent considering the locations and participants.

4.2.4 ‘In-the-wild’ as a potential mixture of field and showroom

As already highlighted in Chapter 3.5 I would like to point out potential blurring of boundaries between the field and the showroom as places of research. The field is where the design researcher observes and gains knowledge on the context for their designed artefact or for their design intervention. However, when the design

researcher takes designed artefacts (e.g. prototypes or technology probes) into the environments of the projected users, then the field research becomes an evaluation of the object in the natural context, or as one could argue a showroom.

Kurvinen et al. (Kurvinen et al., 2008) introduced 5 conditions to review prototypes or other expressions of constructed imaginations for social interaction in natural and social settings.

The 5 conditions in summary are (Kurvinen et al., 2008, p.49ff):

- *Ordinary social settings: More than one person should to be involved in the study, which needs to take place in a real context and not in a lab.*
- *Naturalistic research design and methods: People are involved as creative actors and will be authors of their own experiences by doing what they think is meaningful with the technology to hand.*
- *Openness: It's the open use of the prototype by people. The designer needs to observe and interpret how people use the technology, but should not force people to use the technology in pre-defined ways.*
- *Sufficient time span: The prototype should be in the settings for an amount of time for social processes to develop. If the study period is shorter, it is impossible to get an idea of how people and explore and re-define it.*
- *Special attention to the sequential unfolding of events: the researcher needs to pay attention to the development of the social process in temporal terms, not just focussing on the outcomes*

These conditions are useful pointers in regards to studying social processes and interaction around the designed artefacts, but they may not always be feasible or practical. In particular, the sufficient time span guideline might be difficult to achieve in reality, when the field locations are not easily accessible (e.g. care homes). Where the field intervention cannot follow all the guidelines as suggested by Kurvinen et al., it could be interpreted as a showroom for social interaction.

Koskinen et al. also see alignments between field and showroom. They demonstrate with the examples of Dunne and Raby's projects Placebo and Evidence Dolls, where products were given to ordinary people, that "*as encounters with everyday life become more important, this approach [showroom] gets closer to field research" (Koskinen et al., 2011, p.96).*

It brings out the question: how can the design researcher evaluate the data she or he gathers when people are trying something novel for the first time? There are no other

instances to compare the data with until another round of research is being conducted.

Notwithstanding the main aspect of the showroom as a place of research is that data is not being treated as facts and subsequently exploited for scientific research. The showroom is there to gather stories and examples to create a rich understanding around the designed artefacts. Some interaction and design researchers use Latour's Actor Network theory as a way of looking at the complexities of interactions around designed artefacts (B. Gaver & Bowers, 2012), activity theory (Kuutti, 2009), or wild theories (Rogers, 2011). Similarly, field research using ethnographic approaches can make use of stories and insights in order to create vignettes, which create an empathetic understanding with the stakeholders in the research (Kurvinen et al., 2008).

I have made *wild theories* by creating a theoretical framework for the TT, which I describe in the design journey, and which laid the foundations for my abductive thinking around possible social interaction. Overall, I subscribe to an interpretivist paradigm, particularly to the concept of embodiment (P. Dourish, 2004) and the 'situated perspective' (L. A. Suchman, 2007; L. A Suchman, 1987) and conduct research with a pragmatist outlook. From my point of view, it does not matter, which theory might be most applicable since this type of research is by nature explorative and will bring out unexpected aspects. As long as people feed back on the intervention aiming to facilitate social interaction (be it by taking part, enjoying it or by ignoring it), the design researcher can learn from the intervention about their own assumptions and people's interpretations.

In the following I will argue that I collected returns rather than facts with interventions in natural and social settings.

4.2.5 Collecting returns rather than facts

Considering that my interventions were 'in-the-wild' and closer to showroom than field research, I prefer to use the term "returns" for the data gathered and observed (W. W. Gaver, Boucher, Pennington, & Walker, 2004). All the empirical data collected was not measurable and not comparable in the first TT in-the-wild intervention since it was a system older people and students had not seen before[28].

[28] People may have been familiar with Skype or other video conferencing software, but the kiosks, which were built on inspirations from TV design, the volume mechanism and the placement of the kiosk, were novel.

In this light I argue that the interventions with the TT acted similarly to *probes* (Brandt, Binder, & Sanders, 2013; B. Gaver et al., 1999; Hutchinson et al., 2003). With probes the researcher engages participants to express their sense-making and through this (as with empathy probes in dialogue) the researcher can learn about the meanings associated with the artefact/probe.

Cultural probes have been turned and adapted into variety of data collection instruments such as technology probes (Hutchinson et al., 2003), information probes, empathy probes (Mattelmäki, 2005), design probes (Wallace, Mc Carthy, Wright, & Olivier, 2013), urban probes (Paulos & Jenkins, 2004).

The original *cultural probes* package included maps, post cards, diary and a camera (B. Gaver et al., 1999), but its format and content has since changed immensely. The ethos of this form of data collection was to look into the participants' perspectives of the world.

Although a fair amount of literature has been published on probes, literature provides a pluralistic view of probes. Depending on the research fields, probes may have been (mis)used to provide detailed user information rather than inspiration and dialogue. Data derived from probes have become "fodder" for social scientists (Graham, Rouncefield, Gibbs, Vetere, & Cheverst, 2007) and inspiration for designers. Wallace et al. describe in detail how probes have been designed for the specific context in their research (Wallace, Mc Carthy, Wright, & Olivier, 2013). Although they provide examples and directions on how to design probes, it can be difficult for researchers new to this approach to understand how to actually make a probe and to establish whether the probe was working well or not. The latter will always be challenging to assess because of the variants in possible outcomes of the probes (due to their intentional ambiguity and subjectivity in the data collected). It may be that participants simply did not enjoy taking part, the purpose of the probe was misunderstood, or that the probe lacked a facility in its design, that catered for feedback participants wanted to give.

Hutchinson et al. describe a probe as "*an instrument that is deployed to find out about the unknown - to hopefully return with useful or interesting data*" (Hutchinson et al., 2003, p.18). Hutchinson et al. (ibid., p18) used technology probes to address goals from different disciplines working on a multi-disciplinary project:

> *"Technology probes are a particular type of probe that combine the social science goal of collecting information about the use and the users of the technology in a real- world setting, the engineering goal of field-testing the technology, and the design goal of inspiring users and designers to think of new kinds of technology to support their needs and desires."*

They argue for technology probes to be simple, flexible and adaptable. Whilst staying in the environment of the user, the technology probes can collect data on the usage.

Parallels can be drawn from technology probes to in-the-wild research with the TT. The TT was developed as a simple prototype, the placements were flexible and to a certain extend the TT was adaptable. However, the TT did not collect any data itself, since I made a conscious decision not to record the video connection in order to assure potential participants that their video image was not collected or stored.

Despite this, I argue that the TT in-the-wild interventions also addressed the social science goal to learn about use and users, the engineering goal to understand whether the hand mechanism and technology worked and the design goal of inspiring users and designers for future applications and placements with *the returns*, that I collected. These *returns* were clusters of participants' and my experience, which I was able to document. The returns could be very specific or pluralistic and addressing various goals. The relationship between data, returns and insights is represented in the diagram figure 18.

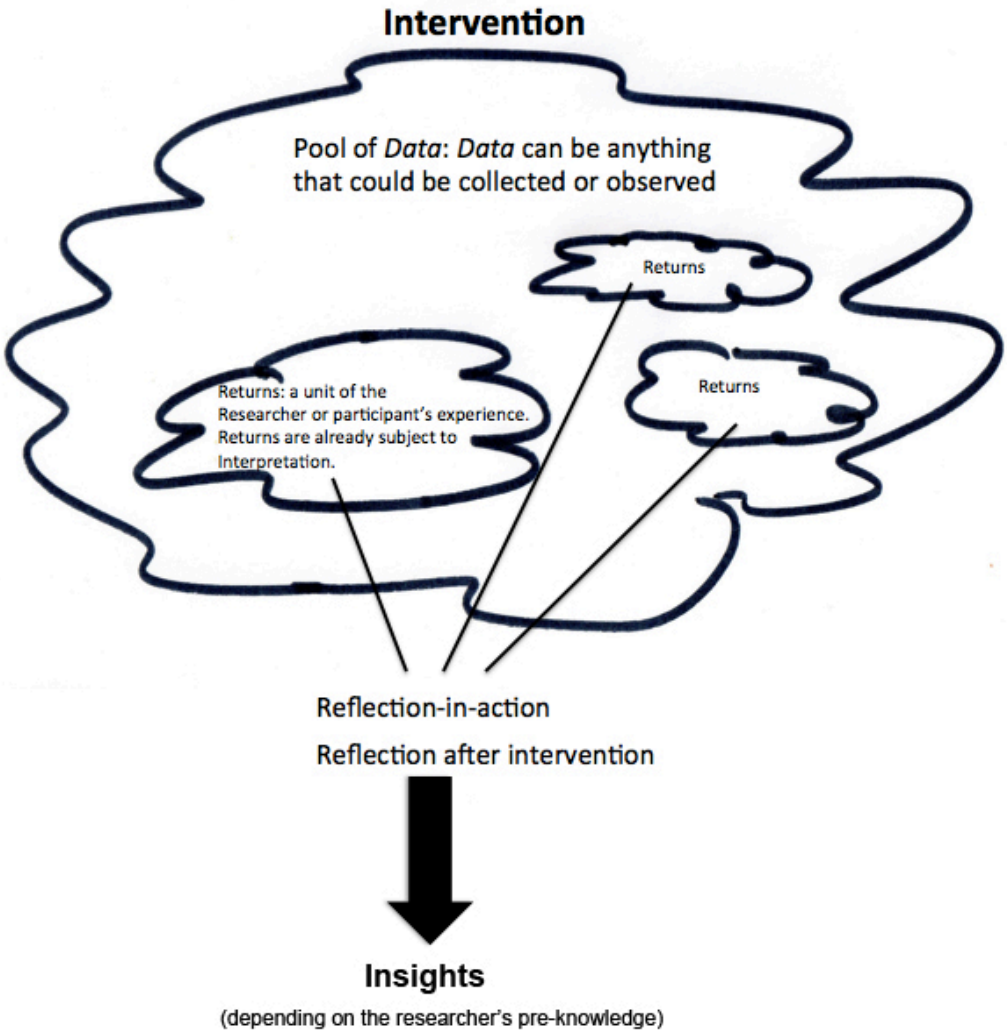


Figure 18: Diagram to demonstrate the relationship between data, returns and insights collected during and after an intervention

During the intervention the researcher collects returns from a pool of data that arises around the proposed artefact. Data can be anything that could be collected or observed. Returns are a cluster of the researchers or participant's experience of the intervention and already subject to interpretation based on the person's experience. Returns can come in different sizes. It depends on how the researcher has chosen to collect (e.g. writing down) the returns. At the time of the returns collection the researcher does not necessarily know, which of the participants' or his / her experiences are significant to gaining insights. With holding more interventions the researcher will develop an understanding and might have reflection-in-action insights. After the intervention took place the researcher needs to reflect on the returns, review the interpretations and further insights are likely to be gained. The

development of insights depends on the existing knowledge the design researcher has and his / her openness to see situations from a different perspective.

In total there were 3 rounds of in-the-wild interventions with the TT, connecting different locations and age groups with each other. During the intervention people walked past, were curious, did or not interact with and through the TT, all these events and reactions are part of the pool of data. During each round returns were collected in various forms such as interacting and speaking through the TT, observations, questionnaires, post-use interviews. A return from the first intervention for example was: *Students were hesitant to put their hand into the hole. " I wouldn't put my hand in there, I expect to find a keyboard" "you need to tell me who it is connected to"*. (See the full list of returns in appendix 4.6.)

I subsequently interpreted the returns, whether they addressed engineering, social science or design perspectives. Most of the times the returns addressed more than one perspective, like the example above, which can be interpreted from the engineering and design perspective. The engineering as to what interaction mechanism was expected and that the current one was not appealing. Without providing any information around the intervention (i.e. ambiguity in design) it left participants with a lack of information around who are connected to.

Overall, the returns collected broadened my knowledge about older active and younger people and their social interactions with live video connectivity. The returns also informed possible engineering and design changes to the TT and improvements to the set-up of the interventions. Insights occurred after collecting returns and when I learnt something new or unexpected, but this depended on how much I knew before. For example, it became obvious after the first round that the hand mechanism did not work intuitively, but it was only after the second round that I had a fuller insight into what was expected or feasible as an interaction mechanism.

In the next section, I discuss possible interferences due of the presence of the designer researcher during the intervention.

4.2.6 Presence of the design researcher during interventions

In the social sciences observations have been made how the field research set-up and the presence of the researcher can affect the behaviour of participants.

In general, there are 3 very broad categories of factors, which affect human behaviour in a field research (Draper, 2014).

- **Physical and material factors** such as lighting level, physiological conditions and money offered
- **Direct social effects** such as legal obligations, wanting to please someone or to help
- **Effects relating to cognitive factors** with the participant such as the participants' interpretation of the context they are in, participants' expectations and beliefs of the appropriateness of what they do and learning effects

One of the most well known influences in field research is the Hawthorne effect. There is no unified definition for the Hawthorne effect in literature; however, Draper offers one definition as (ibid.):

> "An experimental effect in the direction expected but not for the reason expected; i.e. a significant positive effect that turns out to have no causal basis in the theoretical motivation for the intervention, but is apparently due to the effect on the participants of knowing themselves to be studied in connection with the outcome measured".

The name of this effect relates to the study it was first noticed. In the 1920-30s John French conducted studies at the Hawthorne works of the Western Electric Company in Chicago, to research the impact of slight work setting changes (e.g. pay, rest breaks). He noticed that the productivity had overall increased, independent to the work settings variations (Rogers, Sharp, & Preece, 2011)

Other well-known effects are the pygmalion, golem, novelty and placebo effects. The pygmalion effect is the phenomenon whereby higher expectations by the researcher (e.g. education research) lead to an increase in performance and the golem effect implies the opposite (low expectation = low performance). The novelty effect implies that participants perceive and respond differently than they would when they are familiar with the situation or construction. The placebo effect is renowned in medical research where participants may be given placebos instead of actual treatment, but still report to experience a change.

It is then clear that the presence of the researcher can have an effect on the participants and their engagement with the artefact, and in many ways this is unavoidable. Being aware of this effect, the more interesting questions to ask are in what way does it matter and how does it relate to the insights gained?

In this respect I subscribe to the phenomenological and pragmatist approaches, which do not separate between emotional versus cognitive experience but considers the

felt experience as a whole. This tradition (Kant, Heidegger, Merleau-Ponty, Dreyfus, Damasio) argues that "our bodies are [quite literally] instruments of thought" (Turkle, 2011, p134). This perspective relies on interpretation, which does not claim to be objective, valid or unbiased, but systematic and relevant to the real world with subjectivity highlighted rather than filtered out.

During the 3 in-the-wild TT interventions the amount of my presence varied, which led to different returns and insights. For example, in the second intervention I left the TT for exploration by students without my presence. In one of the feedback forms it was criticised that I had left it (the TT) there and was not present. In the other 2 interventions I was mostly right next to the TT. My presence clearly had an effect, (as discussed in Chapter 9.4 and 9.5) but also gave me the opportunity to engage with the participants and have a dialogue, where I could learn more about their understandings and interpretations. Some positive reactions might have simply been due to the novelty effect of exploring the TT's functionality and doing something unusual such as speaking with older people (see appendix 4.6 first intervention, day 3 for example). By being present I was able to apply reflection-in-action during the intervention and adjust my behaviour and questions towards participants to elicit their experience and understanding of the TT.

The full description of the TT design journey and the returns of the interventions can be found in the design journey description in Chapter 6.

4.3 Approach for 3. Design journey: the TW

The following describes the starting point for the Telewalker (TW) journey, the context and the design process. The TW journey can be described as emphatic product design with one in-the-wild intervention.

4.3.1 The starting point

During the interventionist research activities the opportunity arose to adapt the TT and have it tried out by London care home residents. The TW design journey started from an existing TT prototype. My program was overall still the same i.e. using online video technology for online social interaction, but this time it specifically addressed care home residents. This design journey can be summarised as an emphatic and collaborative product design journey. I immersed myself in the care home environment in order to understand the residents and I worked closely with KIT volunteers and care home management to develop for the design brief.

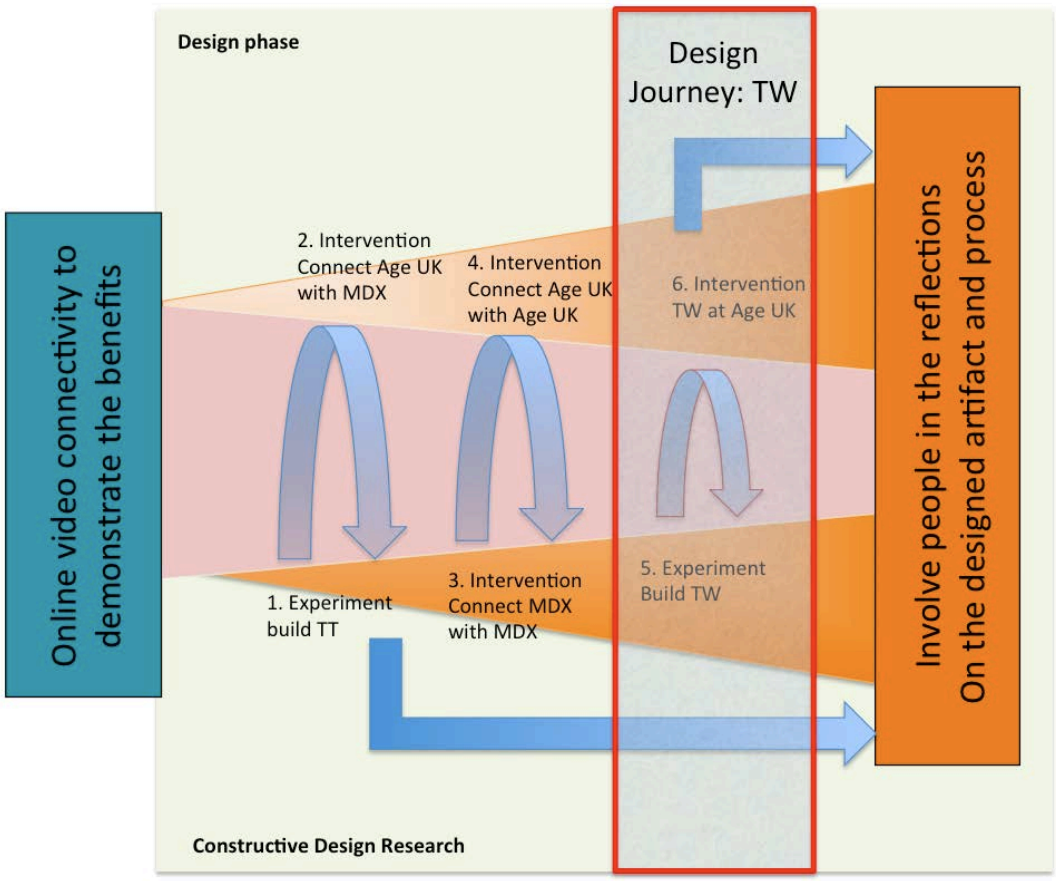


Figure 19: Place of the TW design journey in the overall design process

The diagram shows that after the experiment and interventions with the TT, the opportunity arose to conduct exemplary design research with the TW. The first

experiment was to build the TW. Whilst this happened, residents were introduced slowly to online video connectivity with a laptop and Skype. Due to changes in care home management, an intervention with the TW in natural settings took place at Age UK rather than at the care home.

4.3.2 The context

Jeremy Morris, chairman of KIT, knew through his volunteering work that two care homes in North London, Camden, were due to be merged. The care home at Ingestre Road (approx. 60 beds) and the one at Wellesley Road (approx. 55 beds) were going to be moved into a larger new purpose-built building. The re-location of the residents was originally scheduled to take place in April 2013. Jeremy had told the care home management about my research. They were interested in the idea to use the TT to connect the main lounges in each care home, so that care home residents from the different care homes could get to know each other in a fun way and prior to the move.

Since this was a specific design task with a clear definable target audience, it was an iterative 'designing-for' journey. However, since all the residents can be described as elderly and vulnerable, I as a designer had to work closely with care home management and the KIT volunteers in order to interpret the situation, refine design choices and to build up trust with the residents. Care home management had also advised to introduce residents to the technology in small steps and to use Skype initially to get some early feedback in the interest of being audio-visually connected.

4.3.3 The design process

The design process was a process of close collaboration between volunteers, care home staff, residents and myself. The diagram below highlights the recursive nature between design developments and situation analysis activities.

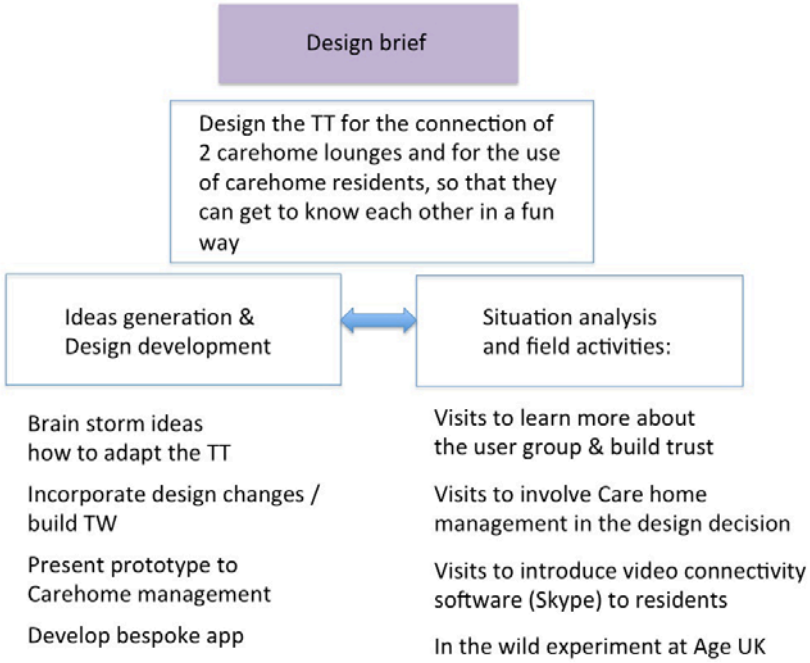


Figure 20: Model of the design process fulfilling the design brief

The activities under Ideas generation & design development and the situation analysis and field activities were conducted in parallel and influenced each other.

Unfortunately, due to delays in the TW development and setting up online connectivity in the care homes as well as due to changes in management, it did not come to the TW being placed in the care homes and being tried out by residents.

However, I had the opportunity to get feedback from older people at Age UK on the prototype. The clients, visiting the Age UK daycentre in East Finchley, can be described as a mixture between active older and vulnerable elderly (considering that vulnerability is a dimension). For half a day the daycentre clients reviewed the TW concept and functionality. This in-the-wild intervention was important, so I had direct feedback by the 'potential' target group to inform the narrative for the extended showroom, the co-design activity in my 4th design journey.

The full description of the TW design journey and the returns of the intervention can be found in the design journey description Chapter 7.

4.4 Approach for 4. Design journey: co-design workshop

The following details the methodological approach for the final collaborative activity in the design process, namely the extended showroom. This section places the extended showroom in the landscape of innovative generative tools. It highlights the importance of making in order to engage non-designers creatively and reflectively in the design process. It further describes the direct influences for the toolkit, which was designed the extended showroom.

4.4.1 The design process reflected through co-design

With my desire to hand over control of my design propositions to people, who have an active interest in the situation and are experts in their roles, I created an *extended showroom* about my design process for debate and co-creation. For this I invited selected participants to form groups consisting of one designer, one person from academia researching older people, one person working with older people through an organisation (e.g. care home) and one older person. Three groups were asked to reflect on my journeys and the physical artefacts as well as to co-design social online interaction technologies by going through a set of exercises.

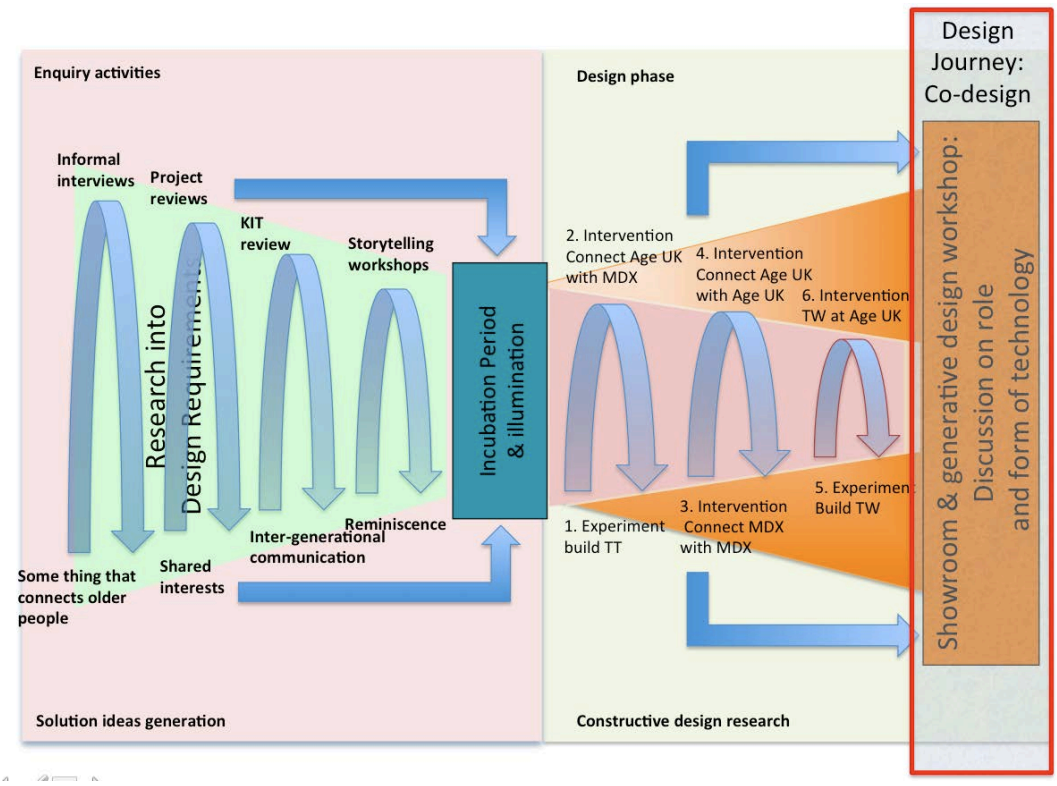


Figure 21: Model of the design process highlighting the final activity

I call the final co-design activity an *extended showroom* because it included a narrative of my design journeys and further sources for inspiration for participants as well as generative co-design activities. To this point I have not found any literature referring to a similar mixture of showroom and co-design, although parallels can be found in the literature discussing the involvement of participants in co-creation (Buur & Matthews, 2008; B. Hanington, 2003; E. Sanders & Stappers, 2012).

4.4.2 What is co-creation?

Sanders and Stappers define co-creation as "any act of collective creativity" (Sanders & Stappers, 2012, p.25). Co-creation is mainly concerned with the generation of ideas and is usually placed at the beginning of a design process. Co-creation can be understood as more encompassing than co-design, though the aspects of differentiations are malleable.

Co-creation has been around in different disciplines under different names. In business and marketing there have been various methods and techniques generated to involve consumers in the development of new products, other than focus groups and satisfaction surveys. Von Hippel introduced the concept of *Lead user design* in the 80s (Herstatt & Hippel, 1992; von Hippel, 2009) and an array of tools, toolkits (IDEO, 2009) and techniques (De Bono, 2009) to involve people in the process for new products or services followed suit. Lego is a company leading by example in involving their online fan base to inspire their new developments (Lego, 2014) .

The benefits of involving people in co-creation are associated with promoting cooperation & creativity and outcome acceptance. It can also improve people's (or customers') satisfaction and loyalty over the long term as well as create conditions for mutual understanding and collective consensus (Buur & Matthews, 2008; E. Sanders & Stappers, 2012).

4.4.3 Making as means for reflection

In co-creation the activity of *making* is a particularly useful way of involving people in the act of creativity and reflection, since making allows people to give shape to ideas for the future (E. B.-N. Sanders & Stappers, 2014).

There are 3 distinct approaches to *making* as a means of design participation (Brandt et al., 2013):

- Participatory prototyping e.g. (Ehn, 1993)
- Probes, such as cultural probes (B. Gaver et al., 1999) and empathy probes (Mattelmäki, 2005)

- Generative tools such as *say, do and mak*e tools (see E. Sanders & Stappers, 2012)

In participatory prototyping it can be assumed that the object of design is already identified (i.e. the design is a product, device, environment). The prototype helps to create representations of the future, which means that "it *helps us see* what it could be" (Brandt et al., 2013, p.155). With in-the-wild research with the TT I offered people to see my vision of the future and although I collected feedback and adjusted the TT, I do not argue that I did participatory prototyping. I do argue that the TT acted as a probe for interaction, dialogue and reflection.

Where the object of design is still in question, as it usually is in the fuzzy front end of the design process, the focus for probes and generative tools is "on *making sense of the future"* (ibid). Probes refer to a design-led approach that invites people (non-designers) to reflect on and express their experiences, feelings and attitudes in forms that provide inspiration for designers (B. Gaver et al., 1999). Mattelmäki developed the concept of probes further to serve designers as a means for participation and dialogue, resulting in co-design (Koskinen et al., 2011; Mattelmäki, 2005).

4.4.4 Generative tools

Generative tools aim to evoke creativity in the people that take part. Creativity touches upon several layers (e.g. physical, emotional), which this thesis cannot address in detail[29]. Tools and techniques to get people into creative thinking are based around the use of ambiguity, gap filling, metaphors, bisociations, narratives and enactments.

Sanders and Stappers distinguish between "*say, do, and make tools and techniques*" (E. B.-N. Sanders & Stappers, 2012, p.166). *Say tools* get people to express opinions, interpretations, but the return is limited to knowledge that participants can recall and express in words. *Do tools* are about observing the activity in the present. They can be seen as factual and precise. *Make tools* involve participants to conduct a creative act in regards to the subject under study. They aim to reveal deeper levels of understanding because they can access both tacit and latent knowledge.

Make tools are good for imagining the future because of the creative, associative and reflexive thinking when making something collectively. When engaging a group into making something collectively, the group has to work through competing ideas, resolve ambiguities or misunderstandings and develop one possible solution. Most

[29] A useful starting point is the universal traveler reader(Koberg & Bagnall, 2003).

generative research will make use of a combination of say, do or make tools during a workshop or series of events. The making can be as tangible as building something with bricks or as abstract as noting down an idea collectively discussed on paper.

The organisers of generative workshops or activities design *toolkits*, which entail the tools and materials with a description for use during the workshop. An infinite number of toolkits can be created to conduct generative research because each situation in design research is different. A good range of examples for toolkits is provided in the book *Convivial Toolbox* by Sanders and Stappers (E. Sanders & Stappers, 2012).

Other innovative approaches to involve people in co-creation are for example provotypes (Boer & Donovan, 2012), Hanington's descriptions of innovative methods such as the graffiti wall (B. Hanington, 2003, p.16) or video prototyping (Westerlund, 2009).

4.4.5 Composing the *make* toolkit

In *make* toolkits there is at least one "trigger" component, which aims to evoke memories or associations in the participant and through which tacit and latent knowledge can be accessed (E. Sanders & Stappers, 2012). A make toolkit further contains materials and tasks in order to *make* (build, write, glue, stick, put together) something.

When composing the *make* toolkit the researcher has to find a fine balance between steering participants into thinking creatively on the subject and giving power to the participants to uncover connected societal issues that need addressing. The toolkit and the execution of the co-design activity can be seen as a joint process of inquiry, which needs to mobilize co-operation and imagination in order to collectively develop the future. Steen has described co-design as a "fragile encounter" between the people involved, where assumptions need to be challenged and openness between people nurtured (Steen, 2012, p.74). In my view this delicate encounter commences with the design of the generative co-design activity as well as with the selection of participants (John Vines, Clarke, Wright, Mccarthy, & Olivier, 2013).

The following describes the influences in composing the extended showroom *make* toolkit.

4.4.6 Inspirations for the generative design toolkit

Inspirations for the generative design toolkit for the extended showroom derived from various sources. Important influences in terms of the structure, tools and technique came from Frohlich et al.'s sandpit research for the SUS-IT research (Damodaran, Olphert, & Sandhu, 2012; D. Frohlich, Lim, & Amr, 2011), the *future workshop* approach (Finn Kensing & Masden Halskov, 1991) and from professional experience conducting UCD research in industry (tacit knowledge).

4.4.6.1 The keep / change / lose technique

Frohlich et al. conducted "extended focus groups" or "sandpits" as they labelled it in order to give older people a voice in emerging ICT development (D. Frohlich et al., 2011; D. M. Frohlich, Lim, & Ahmed, 2014). They explored the topic of memory and identity with older people by offering them 3 novel designs to critique and reflect upon. These 3 designs were a reminiscing radio, a story lamp and a pair of virtual reality glasses to transport one back in time. Frohlich and team worked with two groups of people in retirement age, one computer savvy and one non-computer literate. With both groups they employed the keep / change / lose technique in order to critique the novel designs, by posing the questions whether they wanted to keep or change or lose an aspect of the artefact or concept.

The keep / change / lose technique was implemented in the TT workshop in the final activity in order to guide participants to convergent thinking.

4.4.6.2 The adopted future workshop

Future workshops represent a typical format for traditional participatory design activities (Finn Kensing & Masden Halskov, 1991). Designers, prospective users and managers cooperate in a creative process that consists of 3 phases: *critique* (brainstorm current situation), *fantasy* (positive visions for improved situations) and *implementation* phase (specific actions).

The TT workshop's structure and toolkit built on those phases but with modifications. The reasons for re-ordering the phases of the future workshop were due to the fact that the TT and TW already existed as artefacts. The aim was not to directly criticize the current design, but to activate fantasy and imagination in order to build on the TT and TW concepts. In this respect the first phase became the *fantasy* phase where participants were asked to imagine that they had a magical TT, which could do anything. The second exercise was the *critique* phase, where participants were asked to sit in the specific groups, and to brainstorm scenarios where the TT

concept, i.e. easy to use live video connectivity, might be useful. The *implementation* phase was the prioritization and keep / change / lose activity resulting in high-level concepts.

4.4.6.3 Experience as inspiration

Since I had conducted in my professional life many workshops and focus groups, I applied my practice knowledge and experience when planning the timings & location of the workshop, as well as materials. Being in academic research rather than working for an industry-funded project meant that there was freedom but also constraints around choices. For example, a room in the university had to be used due to financial reasons, rather than being able to showroom the TT in a gallery in central London, which might have been more inspiring for the participants and supported the creative mindset.

The full description of the execution of the co-design journey can be found in the fourth design journey description Chapter 8.

Chapter 5

5 Design journey 1: exploring a website solution

The following chapter reports on the main activities for the research journey where I explored designing a website as a potential solution to designing online social interaction for and with older people. At the beginning summaries of the early research activities are provided. The early research activities are fully reported on in the appendix. Then the development of the wireframes for the Bridge website concept are described. The chapter continues with describing the decision making process for the storytelling workshop as an approach and how it had been carried out, highlighting themes as outcome. This chapter finishes with reflections on my design process so far and the reasons for changing the design space to continue with the second journey. The diagram below show the research process flow in total to provide context for the parts that are discussed in this chapter (main activities) and in the appendix (early activities).

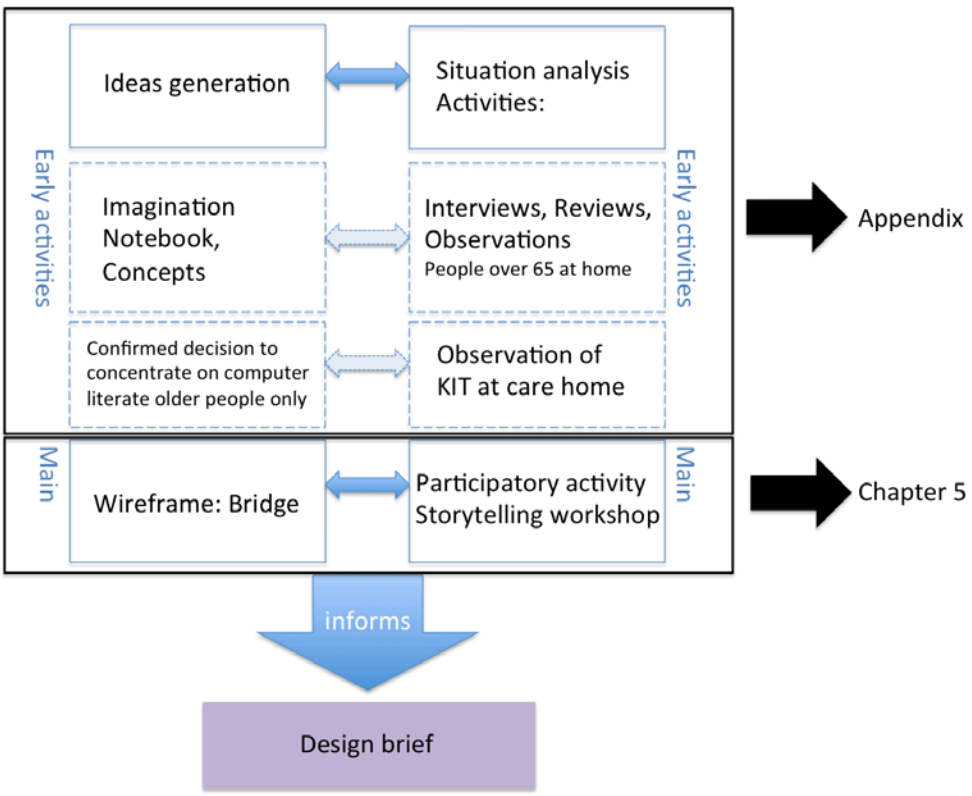


Figure 22: Model for the flow of research activities and where they are reported

5.1 Summaries of the early research activities

5.1.1 Summary of the literature review

Literature review in HCI concluded that user centred approaches were the standard for systems development for older people (see appendix 3.1.1 research around older people in HCI). Reviewed literature showed that most research in HCI addressed older people from an 'impairment compensating' point of view, investigating specialised equipment or technology based health care. Another area was the development of guidelines for (systems) designers, which promoted inclusive design (see appendix 3.1.2, 3.1.3 and 3.1.5) and new approaches to requirements collection from older people (see appendix 3.1.4).

The reviewed literature demonstrated the complexity of aspects that needed to be considered when designing for such a diverse group. Designs were strongly context dependent (location, user group, application, technology) and there was never a 'one fits all' solution. Research with technology addressing older and elderly people had to hold assumptions and expectations in measured ways. Not only the needs but also the perceptions by older people needed to be understood and considered, preferably from a multi-disciplinary perspective. The aesthetics of the technology also played an important role in this.

Considering the context dependency of research activities it became clear to me that I as a researcher had to immerse myself into the world and context of older people living in the UK, in London, where I live and research to be precise.

5.1.2 Summary of the collected empirical data

In the period from 2008 to March 2010 I applied various methods to get to know the user group of older people and to understand their world. These methods were:

- informal interviews (Kvale & Brinkmann, 2008) with older people and people working with elderly people (see appendix 3.2.1 informal interviews)
- contextual inquiries (Holtzblatt & Beyer, 2013) by visiting users in their home and a care home (see appendix 3.2.5 contextual inquiries),
- disclosed observation (Rugg & Petrie, 2006) when observing a computer class for older novices (see appendix 3.2.4 observation of a computer class)

- and by creating an online survey (Kumar, 2011; Moser & Kalton, 1971; Oppenheim, 1975) in order ascertain my assumptions and recruit participants for future activities (see appendix 3.2.2).

From my investigations I found out that there were few older users or older people who had an active interest in online social media or networking sites. (At the time I did not explicitly investigate the use of video connectivity, but respondents did not initiate talking about it). People experienced in working with the oldest old people expressed how challenging it would be to reach the non–computer literate elderly, particularly when living at home (see appendix 3.10 and 3.11). Residents of a care home were likely to switch off when they heard the word "computer" (see appendix 3.13). Observing the computer class demonstrated the levels of difficulties older pupils experience and which strategies the teacher employed to ease the learning process (see appendix 3.12).

The survey validated assumptions about online use and older people's interests. The main benefit of the survey was focussing my own thinking around the topic. In the survey older users frequently answered "I don't have time" led to researching about older people's perception of the remaining lifetime. The socio-emotional selectivity theory (SST) (Carstensen et al., 1999) appears to be one useful explanation for this phenomenon (see appendix 3.2.3).

The home visit (see appendix 3.9) provided the insight that older users might not be resistant to Web 2.0 social media technologies by default, but they were likely to react with dis-interest when features were labelled "Web 2.0 or social networking" and presented to them as such. In this home visit I found an older user happily using the chat functionality of *ancestry.com* with strangers around the world to further his genealogy research, but he would have not labelled it as a social networking activity. This example showed that Web 2.0 technologies were accepted and used by older users when the feature had a specific purpose, and was NOT labelled social networking whilst being integrated on a trusted site. This finding was corroborated by Gibson et al.'s research, who found the NING website during their research frequently visited by older participants because they had the clear purpose to do so (L. Gibson, Moncur, Forbes, Arnott, & Martin, 2010).

Overall these findings led me to concentrate on computer literate older users rather than trying to develop an interface or system that non-computer literate older people could use.

5.1.3 Summary of reviewing websites and systems aimed at older people

In the 2009 the websites (Boomj, Eon, Saga forum) that aimed at online social interaction for older users did not appear to consider the needs of older users in any particular way. The language employed had not been altered, nor additional help or guidance provided. The colour schemes applied did not consider age-related vision impairments; the option to increase the font sizes on the pages was missing (see appendix 3.3.2).

The computer systems considering beginner and older users (SimplicITy and KIT equipment) offered specialised interfaces and hard ware (see app). Their design was different from the “norm” by employing big buttons and reduced number of options. It is likely that the technology acceptance rate would be lower due to the stigmatising qualities of the design (see appendix 3.3.3).

Bettie, a stand-alone touch screen based connectivity system for non-computer literate older people, is a proof of concept. Whether it will develop into a product that would be accepted or is already superseded by tablets and large smart phones will remain in question (see appendix 3.3.4).

5.1.4 Summary of the ideas generation

During the analysis of the situation ideas for possible solutions were formed in my head, which also influenced the empirical information collection process. The journey of ideas started from considering which forms of media older people used as communication channels, reviewing their mutual interests, catering for inter-generational exchange, to reviewing the mechanics of befriending (see appendix 3.4.2) and the functions of reminiscence (see appendix 3.4.3).

Working on the latter two topics I reviewed two more sites to inform my design decision-making process. The two sites were BBC memoryshare (see appendix 3.5.1) and creative spaces (see appendix 3.5.2). I concluded that the execution of the key concepts on those websites (community building on interest in museums’ collection and memory sharing) were already too disjointed and disorientating for the average Internet user.

5.2 Designing a social media website

Through my commercial experience I was most familiar with web solutions, so it was most natural to me to start with the conception of a website, to explore the possibilities of reminiscence, connecting different age groups based on interests and supporting existing friendships with online connectivity.

I previously had evaluated online community portals commercially and read literature related to designing social networking sites (Girgensohn & Lee, 2002; Porter, 2008; Preece, 2000, 2007).

Most of the literature concentrated on how to express trustworthiness in the design, to maintain active participation and to avoid abuse of the site. None of literature concentrated on older users in particular.

Through my commercial experiences working with a knowledge community in local government and an online forum dealing with people affected by cancer I learnt two interesting aspects in user behaviour:

1. Even Internet savvy users will not take up new functionality for online communities when there was not a critical mass of people using it.
2. In an active online community there will be natural occurring phenomena of people taking on roles for interaction in the community. For example, in my commercial work I witnessed how participants adopted self-selected roles of a "helper", where they greeted newcomers and provided them with tips at the start.

5.2.1 My assumptions

Before presenting the development of the website conception I would like to state the assumptions I made deriving from my early research activities and my belief in technological instrumentalism (Waelbers, 2013)[30].

I believed (and still believe) that:

- Digital connectivity can potentially bring more benefits than disadvantages to older users.
- Current digital social tools may have not been designed with inclusivity in mind.

[30] Technological instrumentalism is the opposite of technological determinism. From the viewpoint of technological instrumentalism, technological artefacts are neutral tools, which only influence society because people want them to. In technological determinism technology is seen as the driving force behind cultural and historical change.

- Older users are likely to *enjoy* taking part in online social interactions with a well-designed interface.

5.2.2 Sketching the wireframes

As Buxton describes sketching is a low fidelity and extremely useful tool for designers to develop and discard ideas (Buxton, 2007). It helps when the designer has been trained in drawing, but is not essential in order to work through ideas. The following section demonstrates how the wireframes for the concept of the *Bridge* website developed visually.

On 30th November 2009 I sketched my first outline of a possible home page for a social networking site aimed at older people, which could be used by a person of any age. I decided on the working title “Bridge” with “connecting people now and with the past” as strapline.

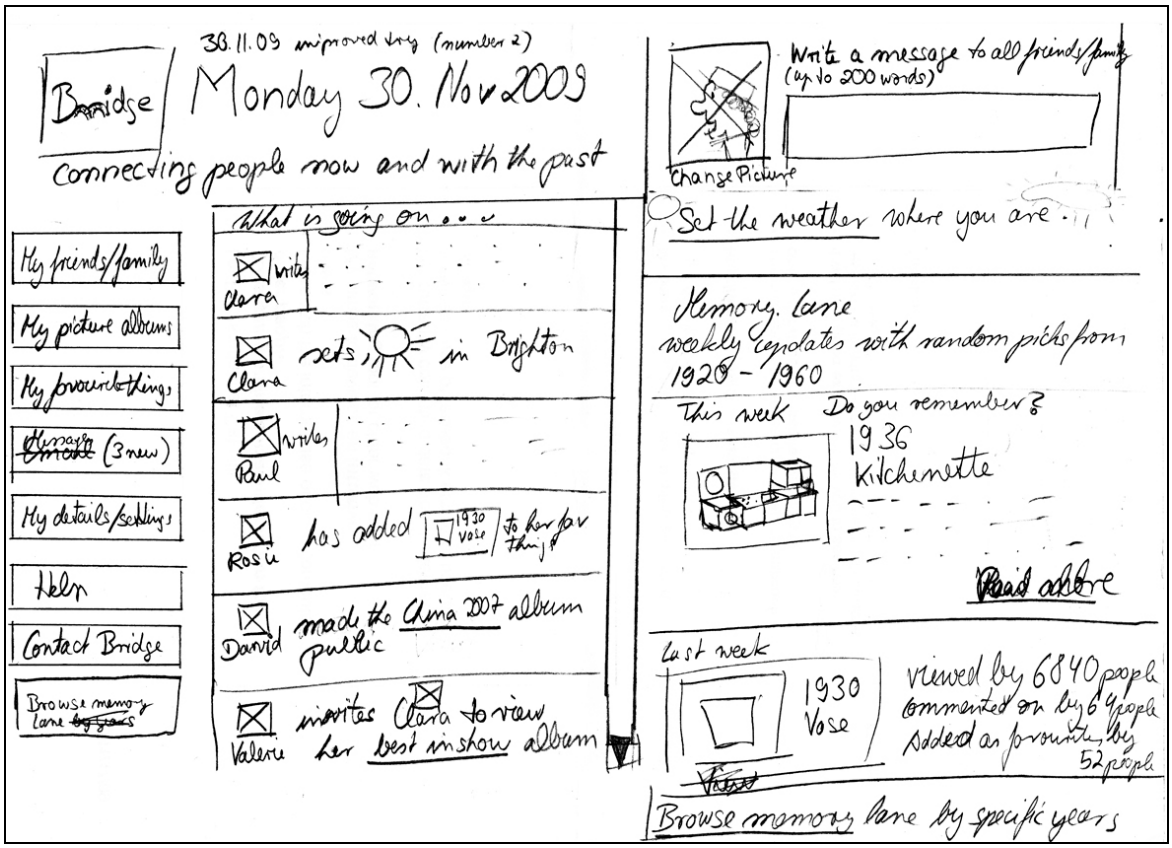


Figure 23: First sketch for the potential 'Bridge website'

On this rough sketch I placed the main navigation buttons on the left-hand side (based on my commercial experience I found that as long as the number of navigation options was manageable, a left-hand navigation panel was preferred by computer users over a top bar navigation).

The middle part of the web page was based on social networking sites' concept of status updates, but with a weather indication addition (a feature that I describe in more detail with figure 23).

The right-hand side of the page incorporated the idea of offering visuals and content related to the 1900-1970s in order to invite memories and exchange between members of *Bridge*.

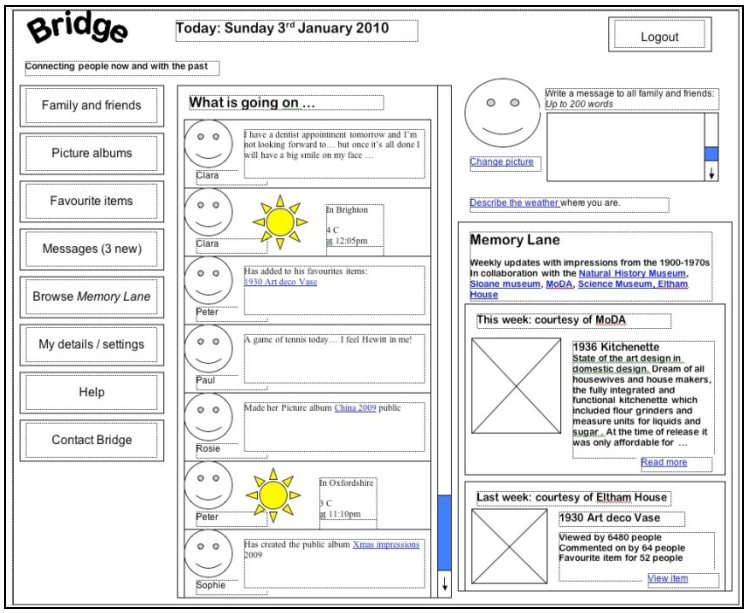


Figure 24: Wireframe - 'Bridge website' re-drawn using Balsamiq

On 3rd Jan 2010 I used Balsamiq to re-draw the rough sketch in order to improve legibility and clarity. Re-drawing the sketch helped establishing further the use of space and functionality.

The homepage is crucial in communicating the proposition of the website. As a designer, one has to strike a balance between conveying the possibilities of what can be done on the site and not overwhelming the user with options presented on the page.

5.2.3 Bridge's main navigation and features

The 8 navigation buttons were placed in an assumed priority of need. From my research activities I found that older people were most likely to connect to family members on a social networking site, thus I placed the *friends & family* button at the top.

Exchanging photos and displaying photos in a slide show were one of the specific advantages of online connectivity in comparison to sending printed photos in a letter and an advantage quoted by interviewees when using email.

Therefore I placed the *Favourite albums* button in the second position. The *Favourite items* button was supposed to take the user to a place where they were able to store bookmarks (e.g. to items in *Memory Lane*), links (to any website) and photos with descriptions, in order to build up a repository of items based on their interests.

The *Messages* button would bring them to an area similar to an email interface, but in this case it was about sending messages within the *Bridge* site system only. The *Browse Memory Lane* button would have led users into an area where they could access museums' content, which had been displayed prior to the last two weeks.

The *My details and settings* button was supposed to lead users to an area, where they could manage their short profile (e.g. uploading a new profile photo) and set their password.

Good practice suggests including a *Help* button or link to offer guidance on how to use the site (Nielsen, 1993; Preece, 2000). For me it was important to have this button in a prominent position, as well as having a prominent button to contact the administrators of the *Bridge* website. This type of guidance was supposed to re-assure a not so confident or infrequent older web user.

5.2.4 Bridge's social interaction functionality

In the *What's going on* section I included the weather indication. The weather indication offered an option for the user to click on the *Describe the weather* link, which was supposed to aggregate local information from the BBC weather page and display it automatically without the user having to type anything (unless they were in a different location e.g. on holiday and therefore needed to adjust their current location).

I incorporated the weather indication idea since it represented something physical about the location of the online user. In my view the display of the weather information of the user's location was a subtle invitation for people to possibly comment or at least to convey a physically anchored presence on this website. Even though older people did not explicitly state the weather as one of their interests, I found that the interest in the weather's performance was generally high throughout generations and western cultures and particularly when starting small talk (Coupland, 2000). Small talk has the purpose of bonding rather than delivering information, fulfilling *"an intrinsically human need for social cohesiveness and mutual recognition"* in a particular cultural context (J. Coupland, 2003, p.5).

The *What's going on* section was supposed to entail reduced functionality in comparison to Facebook's status update. In this wireframe *Bridge* members would use the

What's going on entry field write something to all members that they were connected to and connected members could use their *What's going on* field to comment back (seen by others) or message the sender directly (privately).

The main idea behind *Memory Lane* was that people were prompted on a weekly basis with a visual and information around an item or design from 1900-1970. The items were supposed to be a vehicle to stimulate memories and curiosity in order to interact with other people, by either reading a comment or writing one, if they found it interesting. By changing the stimulus weekly, it was supposed to give users an incentive to log onto *Bridge*.

5.2.5 Visual mock-ups

A couple of weeks later (on 17th Jan 2010) I used Photoshop to create visual mock-ups of the *Bridge* homepage and *Memory Lane page*. I used visuals, text and colours to demonstrate potential social interaction and user activity on the site.

I decided to move the *What's going on* entry field into the middle column to gain more space in the right-hand column of *Memory Lane.* The *Memory Lane* column used visuals based on content from Museum of Domestic Design and Architecture (MoDA).

I chose the range from 1900 to 1970 since wallpapers and other household items & designs would have not been changed frequently due to cost. It was likely that a person born in the 1920s grew up with wallpaper from the 1910s.

Figure 25: Visual layout of the 'Bridge website' using Photoshop

Figure 26: Visual layout of 'Memory Lane'

On the *Memory Lane* page *Bridge* members were supposed to be able to interact with other *Bridge* members, even though they were not connected as family or friends. The envisaged motivations for the interaction were mutual interests and an exchange of memories. I intentionally avoided the word “reminiscence” since I did not want to refer to any therapeutic use of reminiscence.

5.2.6 Feedback and reactions

I discussed the wireframes and mock-ups with my supervisors at the time and they pointed out areas where wording could be improved. They advocated getting feedback on the label *Memory Lane* from older users.

I showed those visuals at the end of the storytelling workshops to elicit reactions from the participants. The official feedback I received from both workshop groups was positive. They felt that the pages were well laid out, appearing simple and clear. The functionality and wording made sense to them at the time.

It was only later when I went through the video recordings of the storytelling workshops that I found a recorded conversation between two participants, which indicated that the design of *Bridge* had an “‘age tag’”, meaning that a person could gauge at one glance that this design addressed people with a mature age. This piece of information formed part of the reason for abandoning the concept later.

5.3 Participatory research to inform the design brief

The following describes my rational for selecting the storytelling workshop as an approach to involve older people in the formulation of the design brief. This section continues with detailing the preparations for the storytelling workshops, including the trial with a pilot workshop. It further reports on the execution of the two storytelling workshops. It highlights themes that were emerging from the workshops and provides a specific example for the group dynamic in the workshop as well as feedback on the Bridge concept.

5.3.1 My ethical motivation

Due to my ethical conviction that people have the (democratic) right to have a say in the development of the technology that was supposed to be used by them (Simonsen & Robertson, 2013), I was particularly interested in the participatory design approaches.

Not wanting to be pushy with my idea for a website and echoing the view that alternative views and voices should be heard in order to explore the ways to design online social interaction, I was looking for a participatory method, which gave older users a voice in influencing the design remit. I was open to have other foci than reminiscence, connectivity between friends and family or physical presence pointers such as the weather.

5.3.2 Reviewing literature for a participatory design activity

Having read literature and the major text books on participatory design (Greenbaum & Kyng, 1991; Schuler & Namioka, 1993) I still found it difficult to find prescriptive guidance on how to design a participatory activity with older people. Most projects I read about were in context with specific organised groups e.g. (Keele University, 2009), companies (Grudin & Pruitt, 2002) or in other ways in more structured settings (Jacobs & Maze, 2004).

Muller et al. offered one explanation for the hesitation of offering a list of participatory design methods. There was the worry that the list of methods could be understood as "*a straightforward, usually linear or sequential, series of well-understood steps that will lead to a predictable and relatively guaranteed outcome*" rather than a

"*scaffold for a complex group process*", which by nature was not linear (M.J. Muller, Haslwanter, & Dayton, 1997, p.259-260).

With these words upfront, Muller et al. decided to list 61 participatory practices in the software lifecycle and commented on the benefits of each approach considering the lifecycle and the participation model (M.J. Muller et al., 1997).

In their list they had the storytelling workshop approach, in which participants share one positive and one negative story about computer usage. It was described as useful for a medium size group and that participants develop an understanding of each other's experiences, commonalities and contrasts.

I decided to concentrate on a storytelling workshop since the linguistic ability of telling stories is well maintained with age (Birren, 2004; Gould & Dixon, 1993), unless a person has experienced a disease (e.g. stroke), which affects their language and speaking skills (Hummert, Nussbaum, & Wiemann, 1992; Ryan, See, Meneer, & Trovato, 1992).

5.3.3 Planning the storytelling workshop

Based on my experience of running focus groups and workshops in my professional working life, I described the criteria for the potential participants as:

- Ideally, up to 8 users per workshop
- 4 people to be between 65-74 years old
- 4 people to be between 75 years old and older
- aim for a mix of gender and a range of ethnic backgrounds
- all active internet users (minimum 3 years) and using some forms of social media
- at least 5 people who have used either:
    - a social networking site such as Facebook, MySpace, FriendsReunited, saga
    - a discussion forum by reading and contributing (e.g. grandparents union)
    - Ancestry.com or Genealogy.com (or a similar genealogy research site) and have exchanged message with someone they didn't previously know
    - bought something on eBay where they exchange messages with the seller beforehand
    - are actively working on a wiki
    - are currently blogging their own blog or contributing to another person's blog
    - have posted videos on YouTube

In February 2010 I described the envisaged format of the workshop as the following:

- Two separate workshops taking place in the week starting from 22nd March 2010
- Length: 2 hours (15 minute break)
- Each workshop would consist of two parts:

First part: Storytelling

Each participant to bring a positive and a negative example of interacting online with people. The examples can highlight technical difficulties, feelings of frustration or confusion or mastered challenges, but can also be specific about what has been exchanged. Participants will have 5 minutes each to tell their stories and afterwards 5 minutes for questions.

Second part: Formulating the design problem

Together as a group formulate problem statements of the current interfaces/ systems. (The problem statement would be a clear concise description of the issues that need to be addressed by the problem solving team).

Build up a *wishlist* of items for the interfaces / systems (not necessarily the solutions of the first)

I imagined that participants could prepare for the second part of the workshop by collecting examples of websites or functionality that they liked or disliked.

My expectations for the outcomes of the workshop were:

- People getting to know each other and their issues, concerns and benefits of online activities
- Problem clarifications
- Design problem statements

5.3.4 Recruiting the participants

Although a considerable number of volunteers had indicated through the online survey interest in subsequent activities, the reality meant participants were spread across the UK and some of them had major impairments. This made it impossible to arrange for a face-to-face activity suitable for everyone at a convenient time and location. In the end none of the survey respondents were able to take part.

Age UK Barnet kindly offered their computer room at Meritage Centre for the workshops to take place. This was ideal since a location outside university and aimed at older

people lent itself to be an accessible facility. This was also inline with Muller's concept of a *third space* (Michael J Muller, 2009). The *third space* was more conducive to group discussion since participants were away from their usual environments.

In order to find suitable workshop participants I contacted key people from organizations such as Age UK Barnet, Enfield Age 55 Forum, Friendship Federation Centre in Barnet and a sheltered housing group in Holloway, London.

An invitation letter was prepared and sent out to the key contacts in order to recruit participants. The letter set out what the storytelling workshop was about, the participation criteria and questions & answers potential participants might want to know. An example of the letter can be found in appendix 3.14.

5.3.5 Conducting a pilot workshop

On 11th March 2011 I conducted a pilot workshop at the Middlesex's Cat Hill campus in order to check order and format (e.g. how people tell their stories) as well as the set-up of audio-visual equipment to record the workshop. Five participants over 55 years old were recruited through Middlesex's Arts & Education department. Despite asking for 2 hours of their time in the initial invitation, the pilot workshop lasted no longer than 1 hour and 15 minutes (a total of 1 hour and 3 minutes recorded discussion).

The pilot workshop brought out improvements to the wording in the video consent form, issues with handling the microphone and a sense for the group dynamic when stories have been told. Some stories got more reactions from participants than others and chances were high that participants talked over each other. It also prompted the need for participants to have their stories prepared in order to avoid extended thinking pauses during the session.

Overall, the pilot brought home that 1 hour of exchanging stories and questions was an energy intensive time. Even if the time was extended it became clear that the formulation of the design problem statement by the participants was not feasible as such and that I needed to concentrate on the problem clarification in the first instance.

5.3.6 Conducting the storytelling workshops

On 13th April 2010 and on 20th April 2010 I conducted 2 storytelling workshops from 2-4pm in the Computer room at Age UK Barnet. Each participant was asked to prepare one positive and one negative story of the use of a social media site. In preceding

telephone conversations I vetted potential participants and helped them preparing their stories. This turned into an important and insightful part of my research since I was able to clarify immediately in the conversation aspects of their context and experience.

On 13th April 2010 the group composition consisted of 6 people:

- 1 female 65 years old, Internet & mobile savvy, uses Facebook and blogs
- 1 female 65 years old, Internet discussion forum experience, 5 years Internet experience, no Facebook
- 1 female 72 years old, 10 years Internet experience, uses Facebook daily, tried out FriendsReunited
- 1 female 80 years old, 1 year Internet experience, uses the U3A discussion forum, tried FriendsReunited, no Facebook
- 1 male 66 years old, ex-programmer, Internet savvy, tried out FriendsReunited, no other social media sites
- 1 male 68 years old, 5 years Internet experience, online masonic group, no other social media

Figure 27: Photo of the first storytelling workshop on 13.04.2010

For the second workshop on 20th April I had previously 5 people confirmed, but 2 cancellations on the day. Thinking on my feet and in order to make most of the resources I decided to ask at the Age UK daycentre whether there were some volunteers interested to take part. I also decided after the coffee break to invite the two members of the video recording team, who were in their twenties, to take part in order to stimulate group discussion.

On the day the group composition for 20th April 2010 consisted of 7 people:

- 1 female, over 70 years old, uses Facebook and Skype occasionally, no discussion forum experience,
- 1 female, over 80 years old, uses Skype, uses the U3A discussion forum
- 1 female, 68 years old, savvy internet user, Skype, passive Facebook use

Ad hoc recruited:

- 1 male, over 80 years old, uses email and eBay
- 1 male, 65 years old, savvy Internet user, Skype, Facebook, FriendsReunited

Joined in after the break:

- 1 male, 23 years old, savvy Internet user, Skype, Facebook
- 1 male 27 years old, savvy Internet user, Skype, Facebook

All participants received £30 incentive money for taking part.

Figure 28: Photo of storytelling workshop 20.04.2010

Both workshops were video recorded. A clip-on microphone was connected to each participant and myself the facilitator in order to avoid disruption when handing over the microphone. Each participant having their own microphone, however, had the disadvantage that people were more likely to speak on top of each other. Having one microphone that was passed around (as it was in the pilot workshop) facilitated turn taking and cues to talk.

It was useful for the participants to come with prepared stories, although on the day when they were re-told, it was notable that not all stories fell neatly into the negative and positive experience dichotomy. The double-sidedness or ambiguity of stories seemed to invite group discussions just the same.

5.3.7 Themes in the workshops' discussions

As expected the workshops were rich in providing stories and understanding around online experiences (behaviour and motivation for use) by the participants. During facilitation I took notes, but the workshops were also video recorded for transcription. After the first workshop I conducted an ad-hoc analysis to discover themes or areas I wanted to address in the next workshop. I later compared my initial list with the video recordings in order to add or adjust the themes.

The following describes the major themes that emerged during the workshops:

- **Issues with understanding the interface (usability, accessibility)**

  The interfaces mostly discussed were Facebook and FriendsReunited. One participant asked, "What's a status update?" Another exclaimed that "There are too many buttons" on Facebook.

- **Not enough guidance or help provided to use any of the social media sites**

  With the exception of a few participants all expressed the need for more guidance for the use of Facebook and FriendsReunited. One participant pointed out how distressing she found the fact that Facebook kept on changing their design and the position of options.

- **The lack of friends in the same age group, who take part using the sites, this was particularly disappointing for the 80plus participants**

  Several participants commented how they were on FriendsReunited, but disappointingly did not find anyone they knew. Another participant described how photos of her 80th birthday party were on Facebook, but she had not seen them because she was not signed up to it. Despite knowing that she might be able to see these photos, it was not incentive enough to join Facebook after she had a disappointing experience on FriendsReunited.

- **Positive stories were around finding new or lost relatives / lost friends**

One participants' story was about finding a person on FriendsReunited, who she knew from primary school and who once took the blame for something she did. This participant wanted to apologize to this friend for years and now, after finding him on FriendsReunited, she had the chance to do so.

- **The importance of the 'intermediaries' such as a grandson, who can demonstrate how to use it**

One participant described how she got the computer equipment as a birthday present from her family, but it was not just the equipment, but also the help of her grandson to set her up and to trouble shoot when she had a computer problem.

- **Insights into users' mental models and the language they use.**

One participant described: "Facebook is like a daily newspaper of your friends". Another person explained that with age "your brain gets holes and where things fall through, so you don't remember everything".

5.3.8 An example for participants' interactions

To transcribe the videos I initially used *Microsoft word* and *QuickTime* to view the video recordings. Then I switched to *Inqscribe*, because with *Inqscribe* I was able to use a foot pedal to view the video and while typing. Since my daughter was born shortly after conducting the workshops (and it was an unexpected earlier arrival) I started the detailed transcription process about a year later. However, during this year of maternity leave I distanced myself from the possible website solution. The reasons for distancing will be described in the following sections. Therefore I did not invest the time to fully transcribe over 4 hours of video, which was mainly focused on current social media use, but rather concentrated on transcribing selected clips (B. Brown & Laurier, 2013; Laurier, 2013).

In the first workshop I had a notable example of participants' disagreement on the use of a particular social networking site. In this instance I had to manage a rather bullying dynamic between a 65year old participant (C65) and other members about the use of Facebook:

Start time (sec)	Participant (First letter & Age)	Content: *(round brackets are descriptions of interactions)* [square brackets are additions by Marianne] – **CAPITALS** are interruptions
26:29	C65	*(S80 and C65 started at the same time)* The biggest reason is that they [older people] don't know other people on it [Facebook], therefore it becomes pointless
26:36	S80	*(S80 touches C65's arm – wants to say something)*

26:38	Marianne	Ok that's a very good reason
26:39	M65	It's not there. The facility [of online social networking] is not there for an older person
26:41	C65	No it's there *(hands open)* but if you don't have no friends to use it…
26:48	M65	It's called Facebook **C65: WELL, I USE IT**… and I think it's for young people **C65: NO**
26:49	Marianne	How would you like to call something then, if it's for…?
26:54	C65	*(Head turned to M65)* You've got saga
26:56	M65	*(Pause)* I don't know [ignoring C65 and answering the name question]
26:56	C65	Social networking for older people
26:57	D68	It needs to be more private as well
27:02	Marianne	Mmh
27:03	D68	So much information that comes across Facebook is very personal and they [the younger people] don't seem to mind sharing it
27:10	M65	An older person would probably be more reserved
27:14	C65	You can change your privacy levels
	S80	*(S80 would like to say something, but can't get a word in)* You see I am …
27:16	M65	Yeah, but we're talking something prospective – You (to C65) know about Facebook, but what about a man or a woman who doesn't know about what Facebook offers and you can do
27:27	C65	Big help file out there
27:28	M65	But we're talking about people who don't actually know much about much, we're talking from a base …a basic level
27:39	C65	You learn anything from only using it, you don't learn anything before you use it
27:44	S80	I still haven't understood what the benefits are of Facebook as supposed to FriendsReunited
27:52	C65	There is no benefit to it unless you know people on it
27:58	S80	*(Leaning backwards)* Oh I know people who have Facebook

Table 1: Dialogue extract from storytelling workshop on 13.04.2010

Since C65 was a daily Facebook user, she was not able to emphasize with other older users who were not on there and expected them to adapt to Facebook. Although she understood and homed in on the point that one needed to know other people, who were on Facebook in order for it to be a meaningful activity, she did not consider changing anything about Facebook's design. It brought out her attitude towards older people expecting them to do what she does.

5.3.9 Specific feedback on the Bridge visual

At the end of each workshop (in the last 15 minutes) I showed the mock-ups to receive feedback on the concept for the *Bridge* website. Participants reacted positively in my presence. They praised the designs for clarity and simplicity.

However, when I reviewed the recordings I discovered an audio recording of a pair of participants (one older and one younger participant) discussing the wireframe without my facilitation. The older participant B82 was intrigued by the thought how memories can spark communication, however the younger participant C27 concluded that younger users would not use it, since it was too obvious for "mature conversation".

Start time (sec)	Participant (First letter & Age)	Content: *(round brackets are descriptions of interactions)* [square brackets are additions by Marianne] – **CAPITALS** are interruptions
1.37:48	C27 and B82	*Both looking at the memory lane print out*
	C27	It's interesting… it definitely has a target audience (B: **YEAH**) do you know what I mean. Obviously for me 1925 [the year shown on print out] it wouldn't be relevant
	B82	It's funny, like I was saying before about the radio In times they had batteries… to re-charge …you wouldn't remember this …this is what my grandma had... there are plenty of memories
	C27	This is a useful tool (B: **THIS IS VERY NICE**), yeah, it is a useful tool, but unfortunately this would be a huge turn off with a certain age group (B: **OF COURSE**). But this is in a sense is probably a good thing because you know yeah I can imagine that I log onto this
	B82	You wouldn't be interested?
	C27	Oh I wouldn't say I m not interested, I probably would relate more to this than Facebook only because my issues are more security driven, none of my students would log onto this … this would be more for a mature conversation
	B82	*(Quiet voice)* This is so interesting … where do I go to … to preserve your own memories? And it's very interesting – for example I say – which you wouldn't know about – someone says that walls ice cream has been on the tricycle with blue and white and someone says oh yes I remember – and that is interesting because it brings back all the memories as well

Table 2: Dialogue extract with comments about *Bridge*

5.4 Additional time for reflection

This section describes how my PhD journey took an unexpected turn mainly due to the extended break because of my maternity leave. Borrowing Wallas' terms to describe the reflective period after learning about the problem, I call the time away from my studies the incubation period (Wallas, 1927). During the incubation period I reflected consciously and unconsciously on my experiences and data I had gathered. The following section details the influences during the incubation period and my decision to follow my intuition. This led to new insights, a change in framing the design space and new ideas for the type of artefact to be built. It also led to a shift in my thinking about my design process. The focus changed from designing one possible outcome to a focus on the design research process itself.

5.4.1 The incubation period - the unconscious at work

In 1926 Wallas documented the creative problem-solving process for the first time by dividing the activity into 5 stages: preparation, incubation, intimation (the flash of illumination), illumination and verification (Wallas, 1927, p.80ff). In more recent literature the process is described as 4 stages with intimation as a sub-phase of the incubation period (Warr & O'Neill, 2005).

After actively learning about the design problem during the preparation phase, it is during the incubation phase when one no longer consciously thinks through the problem, but the unconscious continues working[31]. The illumination phase is the moment when the creative insight occurs, where the idea travels from preconscious into conscious awareness. The eureka moment is frequently depicted as a light bulb (Warr & O'Neill, 2005).

Other authors describe this significant moment as a creative leap (Cross, 2007; Sennett, 2008). In the verification stage the idea is consciously verified, elaborated and then applied. According to Wallas during the preparation and verification stage the same logical rules for conscious thinking are applied However, during the incubation, initiation and illumination phase the conscious thought need to be in a relaxed state "*to allow the unconscious and fringe-unconscious to do their internal associative work*" (Wallas, 1927, p.86ff).

[31] Wallas provides the example of Henri Poincare, who had two great mathematical discoveries each time after a prolonged break: the first one after a break for military service, the second one after a journey (Wallas, 1927, p.81).

5.4.2 Influences during the incubation period

Now that I was a mother for the first time my perception of the world around me had changed. Through my baby daughter I observed her being tactile, and also how she connected to other people, mainly with smiles, getting them to interact with her. Through her I re-discovered the importance of touch, voice and seeing the person, so that one could read the facial expression, create understanding and form bonds with other humans.

Also, since my daughter had reflux and needed to be carried upright a lot, I could not find the time to sit in front of the computer anymore.

Something (a thought / a feeling / my intuition) was starting to nag me about having a solution accessible via a computer only. From my informal interviews I remembered my 83-year old interviewee emphasising, how she went to Sainsbury's on a Monday and the notion of having an online delivery was absurd to her since this took away her reason to go shopping on Monday. This trip to the supermarket was her form of social interaction. Additionally, I noted through my observations at the care home that most residents over 80 years old would 'switch off' when spoken to about computers. I started to grow uncomfortable with the idea of 'trapping' an older user in front the screen. I rather wanted the older person to go outside (assuming they were not completely house bound) and interact with real people.

During this time I also found out that Finerday.com beta had been launched and it won the BCS UK IT inclusive design award 2010 (see figure 29).

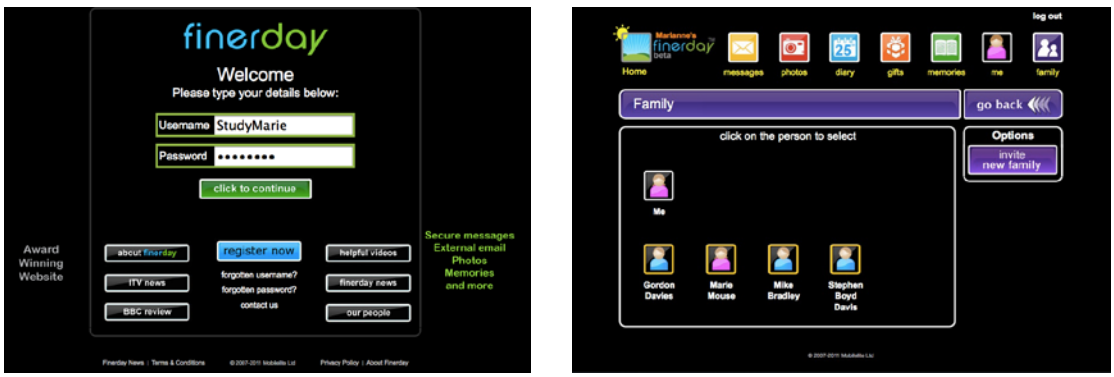


Figure 29: Screen shots of Finerday.com (accessed on 26.10.2011)

On 25.01.2011 I reviewed the site in order to understand its proposition and features. I added a memory and invited others to join, but without having an existing network of friends the experience of the site was limited.

I informally inquired with some of my workshop participants what they thought about finerday.com since the concept of adding friends & family and sharing memories was similar to ideas in the *Bridge* wireframes. Their responses were moderate. They did

not feel attracted to the site. One participant commented that the icons were too large resulting in her feeling stigmatised by the design. All of participants wrote that they would not spend their time on it when they can do the same activities with emails.

I took this feedback as a warning. By then I had also discovered the commentary by my workshop participant, who described the *Bridge* wireframes as designed with an 'age tag'. I was worried that my research resulted in a website, which might have fulfil all the visual and content design considerations for when designing for the older person, but which turned into a website that would have been ignored or not accepted by older users because they felt patronised or stigmatised.

With my designs I did not want to re-enforce the message that *Bridge* users would have been old or over a certain age. This message could be particularly problematic for people, who hold consciously or unconsciously, negative images of older people such as 'being frail' or 'weak' (Kite, Stockdale, Whitley, & Johnson, 2005; Rowe & Kahn, 1998; Thornton, 2002) and therefore would not use services that focussed on an older age group. They could perceive the design as stigmatising.

5.4.3 The stigmatisation trap

According to the Merriam-Webster dictionary stigma is defined as "*a set of negative and often unfair beliefs that a society or group of people have about something*" (Merriam-Webster, 2014). Further explanation shows that the word stigma derives from Latin and means "brand or mark" (ibid.).

There are numerous examples, where older people reject the use of walkers or hearing aids (although it would make their life easier) or prefer not to be seen using the device or design unless they really need to (McCreadie & Tinker, 2005; Mullick, 2001). I felt designing for older people exclusively would either result in specialized accessibility technology or falling into the *stigmatisation trap.*

The *stigmatisation trap*, as I call it, is the situation where the designer has designed a useful and beneficial service / tool / technology, but this design is not accepted by older people since it communicates the message that one is different from the norm (Parette & Scherer, 2004). Sokoler describes stigmatizing technology to portray users "*as disabled, needy, weak or in any other way as pathetic individuals*" (Sokoler & Svensson, 2007, p.298).

Stroud, author of "the 50-plus-market" book, claims that the future of marketing and branding lies with age-neutral marketing strategies (Stroud, 2007). This meant that marketing and product design messages needed to address customers in an age

neutral manner, and not emphasise age or the grey market as such. In my subsequent design journey I tried to be clear in the communication around the artefact that it was designed to connect people of any age, and not only older people.

5.4.4 Following my intuition

With the *stigmatisation trap* in mind and insights from my empirical data collection, I moved away from the idea of fixing older users to the computer screen at home or in front of a laptop somewhere else[32]. Following my designer intuition (Cross, 2007; Dijksterhuis & Nordgren, 2006; Trotto, Hummels, & Restrepo, 2011) I felt that I wanted to design something outside the computer, outside the home, something physical or tangible, but still 'online' and which brought people of any age together.

I was wondering how I could bring the importance of touch, voice and facial expressions back into the artefact. I decided to listen to my intuition rather than continuing with my original approach (see appendix 3.6). I decided to reframe the design space.

5.4.5 Re-formulating problem and solution space

Westerlund describes that the "*design space is the territory of all possible solutions*" (Westerlund, 2009, p.35). He further explains that the design space "*is an extremely complex multi-dimensional space*" and that an exact definition as such does not exist. The design space expands or changes when new variables are introduced into the assignment or design brief.

For clarity, I express my design space with a diagram of the problem and solution space in order to highlight the change in framing my design space. Before spring 2011 my problem and solution space could be described with the following diagram (see figure 30).

Please note that with the diagrammatical representation I heavily summarise information, which does not justice to the insights I had gained and to the actual "thinking space".

[32] In 2009 tablets, iPads and large smart phones were not as wide spread as they are at the time I am writing this dissertation.

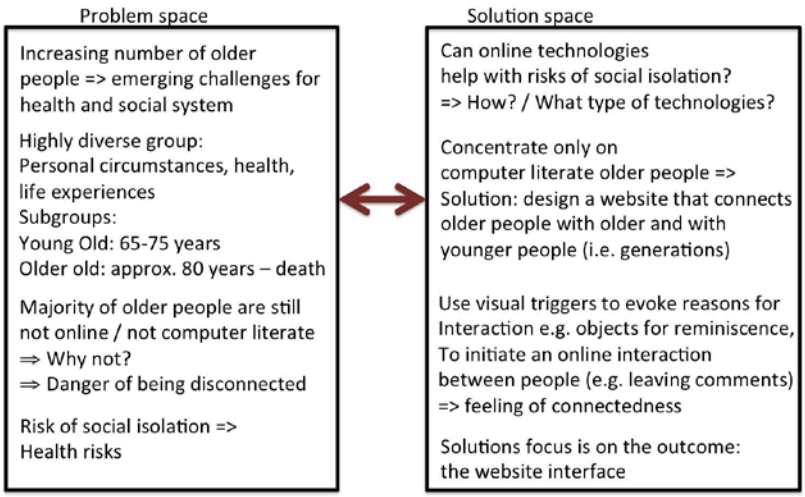


Figure 30: Model of problem space and solution space in 2009-2010

The next diagram shows how I re-framed the problem and solution space during spring 2011 (see figure 31). I added to the problem space the question of where groups of older people spent time in public. In the solution space I included older people who were not necessarily computer literate in my target audience. I also wanted to investigate a physical artefact, which did not look like a computer, and could demonstrate the benefits of online connectivity and at the same time generate social interactivity.

I further changed the focus from building ONE outcome (product orientated) to building a proposition for the wider community to reflect back on. The process and the discoveries throughout this journey were the same important as the built artefact. The latter represented implicitly my assumptions or hypothesis.

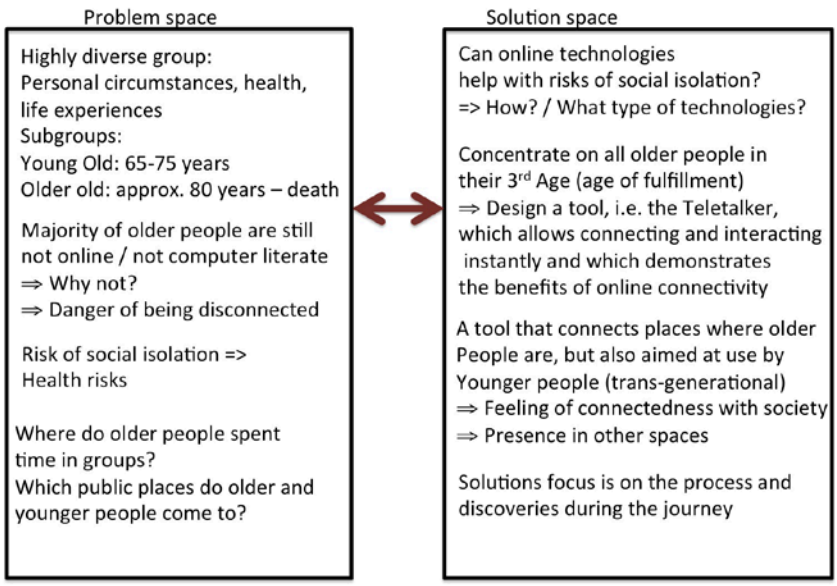


Figure 31: Model of problem space and solution space in 2011

5.4.6 The creative leap

Around spring 2011 I had my illumination, the creative leap (Cross, 2007), and came up with two ideas. Those were still based on the themes reflected as outcomes of the storytelling workshops and previous research activities, but I allowed myself to re-frame the design problem to include non-web literate, older adults.

One idea involved the making of a Litfaßsäule. Mr. Litfaß invented the Litfaßsäule in Germany in 1855 in Berlin. It is a column of ca. 3 meters height to present local information and was erected to avoid graffiti or placing unofficial posters on house walls. My idea was to integrate online content and stories about older people's social media use (based on my storytelling workshops) into the column. People visiting the column could walk either way around it or sit on a bench nearby, which could have served as an extended space for social interaction to happen. The exhibition of the column would have been an event to discuss and highlight messages around the use of social media by older people.

The other idea was the Teletalker[33] (TT). It worked with the idea of live online video connection installation connecting two public places audio-visually. The volume would be muted by default. A very simple mechanism allowed a person to switch the volume on, so that a conversation could take place. I continued working with the TT idea for several reasons. One of the reasons was that the TT provided a platform to facilitate online social interaction more obviously than the 'Litfaßsäule' idea. Another reason was that I was more familiar with tele-communications than with art installations and there was already a body of literature on telepresence, which I was able to refer to. A further reason for continuing with the TT idea was that it appeared to be less resource (i.e. materials) intensive.

5.5 Reflections on the first design journey

The main part of my reflections during this journey took place when I was on maternity leave. The extended time to think about the situation and design challenge allowed me to explore and listen to my intuition. This resulted in a paradigm shift in how I address designing online social technologies for and with older people. In user-centred as well as in inclusive design, the concept of "the user" appears to specifiable. But with making assumptions around "the user", design can result in perfectly suitable designs, but these may not address people's desires, preferences

[33] I chose the name Teletalker as a working title but it's not to be confused with the big button phone called Teletalker. Other names at the beginning were Telespeak or Telespeaker, but I settled for Teletalker.

and in the worst case fall into the stigmatisation trap, where they are silently or overtly rejected.

Traditionally, the user-centred and inclusive design approaches assume humans as goal directed beings, which fulfil tasks based on their needs (e.g. Maslow's pyramid of needs). However, as research (ANEC, 2014; P. Dourish, 2004; L. A. Suchman, 2007) shows humans are not always task-orientated, but act with idiosyncrasies, inconsistencies and preferences. The motivations or reasons for human's unpredictable actions do not necessarily happen on a conscious level, which means that a person cannot articulate them when she / he is asked during requirements collection.

Gibson et al. corroborates with their research on older adult's use of SNS some of my themes I had found during my research activities (lack of purpose / benefit, concern with privacy, proxy use) (L. Gibson et al., 2010). They also found that the NING website, set up during research and which contained some SNS features, had been well visited by their participants because it had a clear purpose (ibid.).

I could have continued with the website as a solution to the overall question of how to design online social interaction for older people. The outcome of my research could have been an iteratively tested and potentially attractive interface for a social media website, based on the concept of reminiscence and exchanging memories to draw users to it. This outcome would have been a 'satisficing solution' (Simon, 1996, p.27), which would have left me dissatisfied. A satisficing solution is a solution, which equally will bring contributions to the pool of knowledge, but it will have not stretched design researchers in their expertise (Goeker, 1997)..

With designing a website solution aiming at older users I realised that I was not addressing the real challenge of designing online social interaction for older people, who were "in need" of social interaction.

Through this journey I had learnt that those who were already online and maintained sustained online use did not need to have a website specifically designed for them. If they wanted to use the Internet for social interactions on a Web 2.0 level they were able to do this, by using existing sites, where they were likely to find other people either of their age, or by mixing generations. Or they were already using Web 2.0 features without knowing that they were using functionality for online social networking. Particularly, when this functionality was integrated on websites without labelling them as such (e.g. ancestry.com).

I felt that the real challenge lay with older people who were not online yet or novice older users who were in danger of abandoning computer use due to lack of perceived

benefits. For me it became about crystallising a clear benefit of online connectivity and to consider forms to present the technology in an intuitive and attractive way to older non-computer users. In the following journey I took the lead with my designer vision, which I gained out of reflection on the previous research activities.

5.6 How does design journey (DJ) 1 address the sub-research questions 1-4?

The following section addresses the 4 sub-research questions:

5.6.1DJ1's contribution to sub-RQ1

How do older people currently undertake online social interaction?

Since I wished to understand more about older people's socializing behaviour and online behaviour I started my research wide at the beginning of the PhD journey with various research activities. The literature review and my early research activities contributed most to answering this question. I observed, interviewed and surveyed older people and older users to understand their behaviour patterns.

The literature review and the recent ONS report showed that the trend is an increasing number of older people take part in online social interaction in the UK (ONS, 2014). The 3 main online activities users over 65 years do, are (still) sending and receiving email, finding information about goods and service and using services related to travel and accommodation (ONS, 2010)

According to the latest Ofcom update the use of Skype has slightly fallen for the group 65+ (Ofcom, 2014). Usage of Facebook or other social networking sites by users over 65 years is only slowly increasing (ibid.). In summary, sending email is still the most dominant form of online social interaction for older people.

At the same time, the type of devices to access online services and the Internet is increasing. More people over 65 years old are now owners of smart phone and tablets (ONS, 2014). In the long term this could change the dominance of email to other forms of online social interaction through these devices.

Little can be said for the trend of the older old since there are few reports distinguishing between young old and older old people and their online behaviour. At least Ofcom distinguishes since 2013 between the group of 65-74 years and 75 +, but statistics for the 75+ group indicate only a weak uptake of online connectivity (Ofcom, 2013). However, with the young old getting older there will be more older people online, which could be an incentive for more peers to be introduced to online connectivity. For example, the storytelling workshops brought out that the use of sites, which built on the concept of finding peers (e.g. FriendsReunited) only became attractive when a critical number of peers were using it.

In addition, in the group of the older old there are some role-modelling exceptions, who are very active online. For example, Geriatrics 1925, a YouTube blogger, and Ivy Bean, who was until her death in 2010 the oldest tweeter with 104 years; they both had a large number of young and older followers[34]. It appears that the person's personality (e.g. out-going personality), motivations (e.g. gerotranscendence) and individual circumstances (e.g. support provided through care home institution) play an important role to being open to using Web 2.0 technologies to connect with a wider community.

With the home visit I found out that an older user was happily using features of Web 2.0 on a premium subscription site for genealogy research, but without any awareness about the classification for those features he would have never called it Web 2.0 or social media. I would have not made this observation when interviewing him over the telephone interview and with a structured questionnaire. And in this respect using the data from official surveys and reports can be dissatisfying since it lacks detail on the context of real behaviour.

Through the literature and project review I found some examples of designing novel forms of online social interaction, which did not rely on a desktop computer interface. These examples were Bettie (Arent, 2008), the activator (Romero et al., 2010) and the presence remote control (Sokoler & Svensson, 2007).

5.6.2DJ1's contribution to sub-RQ2

What are the design considerations when designing online technology for older people?

In every design process it is firstly about understanding the envisaged target audience and to make sense of the heterogeneous group of older people I decided to concentrate on older web users.

Since older users are highly diverse in their abilities, it is helpful to adopt the inclusive design approach, which effectively means good design for the largest section of the population (Redish & Chisnell, 2004). Overall, older users can be described as active older people, who may be vulnerable to some risks. For example, they could be excluded from using a website when the use of colour contrast is poor, which makes reading difficult. The range of guidelines and tools for accessible website design has been reviewed (see appendix 3.1.4 and 3.1.5).

[34] The oldest Facebook user is said to be Maria Colunia Seguar Metzgar with 105 years, who apparently uses an ipad to log-on to Facebook (Stebner, 2012).

With my visual mock-ups for the website idea, I considered guidelines such as the size (and scalability) of fonts and colour contrast. But in the end I did not pursue the full path of an inclusively designed website. Therefore, it remains speculative whether my designs would have been accepted (V. Venkatesh et al., 2003) and used by older people and possibly younger people, or not.

However, other examples of websites / interfaces that addressed older people such as Finerday.com or SimplicITy appear not to be well accepted and this has most likely to do with what I call the **stigmatization trap** (see Chapter 5.4.3).

In order to avoid stigma through a design solution, it is helpful to keep the language and communication around it age-neutral and to integrate the technology smoothly into the daily routines or surroundings. The optical industry with a wide choice of glasses is a suitable example where technology has been made attractive and accepted by any age group.

An additional way of increasing technology acceptance is by building the proposition on intrinsic motivations such as playfulness, curiosity and nurturing (Romero et al., 2010; Venkatesh, 1999).

Another consideration for the development of new online technologies is the question of motivation or reason for changing the existing ways. According to my literature review the main reason for older people not to use the Internet is the lack of perceived benefits (Melenhorst, Rogers, & Bouwhuis, 2006; Osman, Poulson, & Nicolle, 2005). This implies that care needs to be taken when developing new technological systems[35] to crystalize the main benefit and to communicate this. Ideally, this benefit should not be prescribed, but jointly constructed so it is meaningful to all people involved.

By involving the target audience (stakeholders as well as projected users, participants) in co-design activities[36] early in the design process (Romero et al., 2010; Steen, 2013) a greater buy-in (acceptance) and a focus on issues that really matter can be achieved. This can be done with a wide range of methods. Cockton provides a list with over 80 methods that design researchers discussed during the DTFG workshop (Cockton, 2011).

Lindsay et al. list the challenges when engaging with older people for research to lie around maintaining focus and structure in meetings, envisioning intangible concepts and designing for non-work based tasks (Lindsay et al., 2012). According to the

[35] This is in contrast to tinkering or experimenting with technology, where one just sees what happens before pinpointing the benefits.
[36] These co-design activities can be ranging from users as informants to users as empowered participants.

authors further challenges lie with people involved in projects, who may have a dismissive attitude towards engaging with older people or who treat co-design as a "tick box exercise" (Lindsay, Jackson, Schofield, & Olivier, 2012, p.1207). The challenging dynamic in the first storytelling workshop is one example of these challenges.

5.6.3DJ1's contribution to sub-RQ3

How may new online social interaction technologies be made suitable for adoption by older people?

This research question is related to the previous question. For older people to adopt new technology, they need to accept it. Some strategies to achieve greater acceptance have been discussed in the answer above. Please note that this answer concentrates on active older people who are not in a strong vulnerable position (such as living in a care home with dementia).

Further anecdotal answers from this research journey are outcomes from the contextual enquiries and the storytelling workshops. From the home visit I found out that an older user was happily using web 2.0 technology without being aware that he used it. He used the features because they were purposeful to his genealogy research, which points towards embedding new technology in places of interest for older people. Literature and my survey confirmed that typically older people's interests were around gardening, homemaking, watching TV, genealogy, which can be seen as starting points to integrate new technology.

Simply asking older people about their needs does not necessarily mean that the subsequent technology developed will be accepted. This has to do with the aspect that we are not always aware of our needs. A successful designer (or design researcher) will need to interpret the answers by the target audience, whilst reviewing the design brief in order to address the challenge with a possible proposition for the preferred state. Older people are better at critiquing a design suggestion than envisioning something new themselves.

The storytelling workshop was not about asking, but about involving older people with their stories and experiences. The storytelling workshop approach resulted in discussions and insightful dynamics between the participants, providing many insights into the reasons and motivations for using or not using social media sites. Having a support network, or a proxy to help with the computer use is an important factor whether older users adopt or maintain their computer use. The behaviour of

peers is also a motivational reason for older users to learn using the computer and sign up with websites (or apps). However, not finding peers or friends on sites like FriendsReunited leaves disillusionment, which can mean that an older users does not bother signing up to other sites.

Interestingly, the Care Online project implemented some of these aspects with their care online portal in sheltered housing. They offered a support network, peers and first time use guidance. Osman et al. concluded that the online connectivity had a significant positive effect on people's live (Osman et al., 2005). However, the involvement of the researchers with participants throughout this project has to be considered and this is likely to have contributed to the positive effect also (Dickinson & Gregor, 2006).

5.6.4DJ1's contribution to sub-RQ4

Which elements of a method make it suitable for researching new technology with older people?

For this answer I will concentrate on methods applied with active older people as I had concentrated on this group with the website approach.

From my experiences gained in the first design journey I would like to emphasize that **speaking** to an older person and **observing** is a useful way to research his / her use of (current) technology. In this respect I found contextual inquiries the most useful approach because it brought out insights, which would have remained undiscovered otherwise when relying verbal or written exchange alone. Visiting the Ingestre Road care home brought out the immense difference between elderly people in a care home and active people over 80 years old living at home, who I had previously spoken to (see appendix 3.13).

Speaking with older people is important because it is in the dialogue where the researcher can build up an empathetic relationship with the older person. I found the format of chats (and working with a questionnaire as a prompt sheet) worked well when speaking to an older person individually. The informality and freedom to talk about things that would be of their interest took away the concern whether they were giving the 'right' answers or did what I expected. Dunn et al. developed the concept of a questions wheel as a tool for prompts (Dunn et al., 2013). They also found that structured questioning was not feasible, nor natural when speaking with older people during their research about older people and online communities.

The storytelling workshop was a useful format to gain insights into people's understanding of the world. Since a person's verbal abilities are kept well with age, this choice of method seemed appropriate. It was not only at the event of the workshop, where I as a researcher learnt, but also in the preparation phase where the initial interviews for participation brought out further insights and issues.

In regards to vulnerable older people, it was helpful to speak to key people who have meta-knowledge about the particular user group. In my case I spoke with people like Patricia Wright, the care home manager, Jeremy Morris from KIT, Sarah Read, designer of the reminiscence cards and Lisa Dubow, development manager from Age UK Barnet. These stakeholders are additional interpreters of situations when working, managing or providing a service to older and elderly people. Trust needs to be established between the stakeholder and researcher, (i.e. the stakeholder needs to be convinced about the good intentions by the researchers) in order for the stakeholder to share their views and tips freely.

Chapter 6

6 Design journey 2: (the Teletalker) TT

This chapter is split into two major parts. The first part describes the theoretical framework for building the TT, an online audio-visual connectivity system connecting two locations. It presents the research and technical review of projects involving online video connectivity, which informed the design decision-making process. It continues with the description of the first experiment, namely the construction of the TT. This process has been iterative and modifications were made before the TT was ready for use in the first intervention.

The second part of the chapter describes the 3 interventions conducted with the TT. The 3instances were very different in-the-wild interventions; the first one connecting older with younger people, the second one younger with younger people and the third connected older with older people. With each intervention the set-up and a summary of outcomes are detailed. Modifications and further technical developments took place mainly between the first and the second intervention.

Reflecting during and directly after the interventions meant that lessons for the next set-up were learnt. The chapter finishes with overall reflections and answers to the research sub-questions.

6.1 Developing the TT idea

In September 2011 when I returned officially to my PhD studies again, I discussed the idea of the TT with my supervisory team, a representative from Age UK and with two neighbours, who were both over 70 years old. I also made sketches to externalise my thinking at the time (Buxton, 2007).

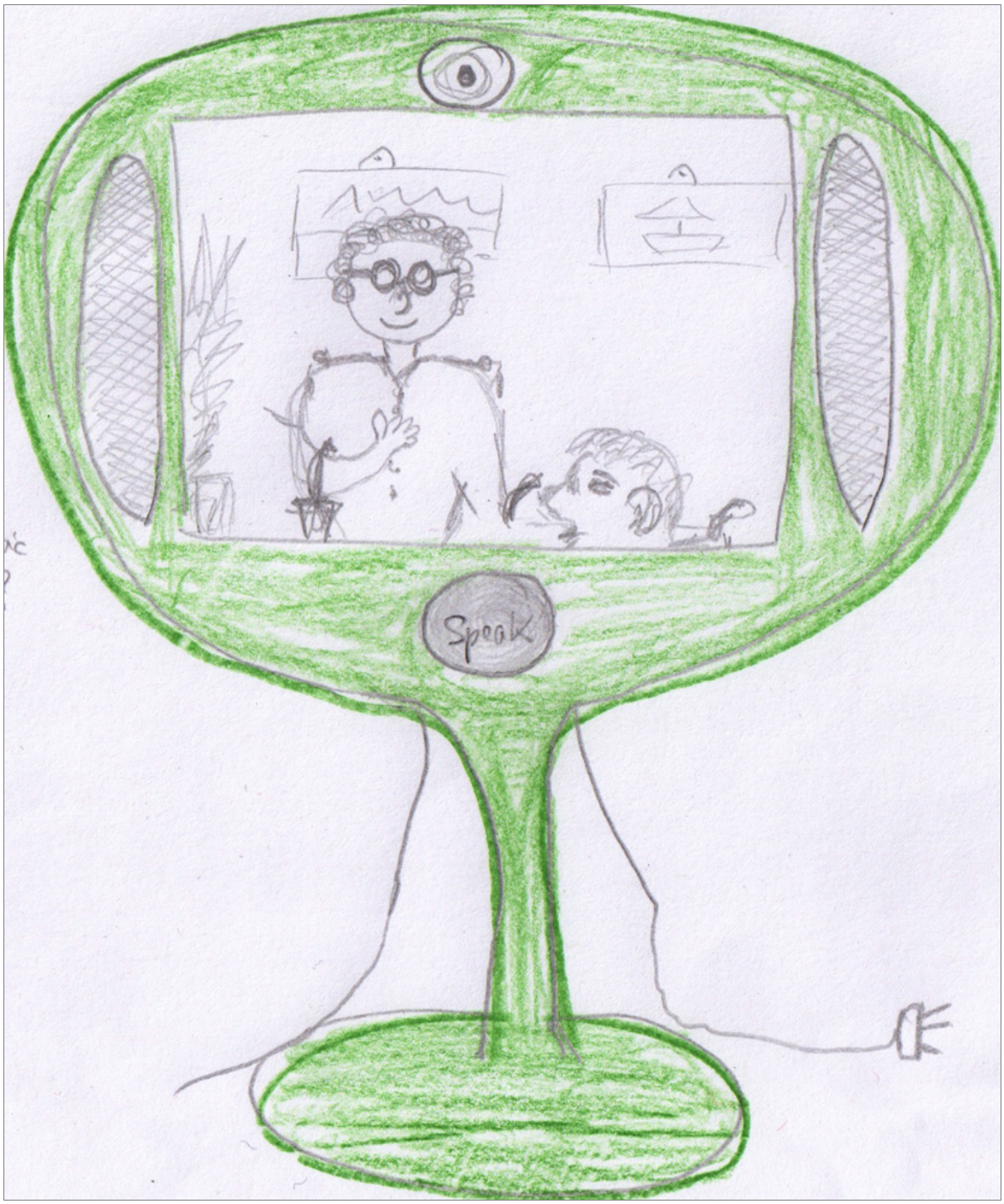


Figure 32: Drawing of the indoor Teletalker idea on 8th September 2011

This sketch depicts the TT apparatus, which has the form of a round ball on a stand containing a screen. On the screen, one sees a person standing and another person sitting in a wheelchair. This view is the live online video transmission from another place e.g. an entrance area of a care home. The sound would be muted. There is one button labelled “Speak”, which one could press in order to switch the volume on and to communicate verbally.

Figure 33: Drawing of the outdoor Teletalker idea on 8th September 2011

This sketch shows a shelter similar to a bus shelter, with a roof and see-through side panels. The screen, with speakers on each side and camera above, is integrated in the middle wall. The red button is the mechanism to switch the volume on and to be able to communicate verbally. Underneath the button there is a sign telling people which location the TT would be connected to.

At the time I was working with the idea of twin cities. I was living at the bottom of Alexandra Palace in North London and this area (Hornsey) was twinned with Koblenz in Germany, a town my mother lives nearby. I imagined public places such as a park or a central plaza to be connected with a TT kiosk on each side. This connectivity would give people at location a current (seasonal) and visual view into the location of their twin city. People could make a visit to the TT into a reason to go for a walk in the park or in their town centre. Around the TT kiosk benches would be added to relax and to be seen, but those benches, i.e. the sitting space, could also serve as place for face-to-face social interaction locally.

The feedback I received from my supervisory team, Age UK staff and neighbours was positive and encouraging. My “vintage” neighbours – as they called themselves -

strongly supported the idea of connecting different generations. They thought the “apparatus” (I had not settled for a working title then) was ideal for older people since "*everybody knows how to watch TV*". They suggested integrating the TT concept with activities such as book club readings or bingo playing. They pointed out how the screen needed to be a large size to convey the feeling of “presence”. Presence – in the academic sense - is commonly referred to as ‘the sense of being there’ through a mediated environment (International Society for Presence research, 2014; Lombard & Ditton, 2006).

Moving forward with the idea of the TT meant that I had to adjust my research enquiry in regards to current research fields, discussions and existing projects. I needed to understand what had been designed using online video technologies, and whether any of those projects were directly addressing older people. Telepresence (Lombard & Ditton, 2006) as a field that has been established in the 1970s with the social presence theory (Biocca, Harms, & Burgoon, 2003; Walther, 1992) as leading theory, and received great attention with the emergence of online Internet interactions, particularly when using avatars (Mennecke, Triplett, Hassall, Jordan, & Heer, 2011; Zhao, 2003).

The following section describes my theoretical framework based on research, projects and interventions involving online video technologies.

6.2 Theoretical framework for the TT

During the incubation period I discovered key papers on design with older people (Blythe et al., 2010; B. Gaver & Martin, 2000; Romero et al., 2010; Sokoler & Svensson, 2007; Svensson, Sokoler, & Svensson, 2008) and read more about the differences in communication channels and how it affects our behaviour. On this I built my theoretical framework for designing the TT. The following section describes the understanding I gained from those papers.

6.2.1 Designing for playful persuasion

In 2010 Romero et al. published a paper titled "Playful persuasion to support older adults' social and physical activities" (Romero et al., 2010). This paper was a case study; an output in the context of the Independent living project undertaken by Philips, DevLab, Orbis, NH hotels and TU Eindhoven. The Independent living project investigated "*how to create playful persuasive solutions for frail seniors and persuade them to participate in social and physical activitie*s" (Romero et al., 2010, p.485ff).

In this project they applied a user centred approach with a research through design methodology in order to achieve a novel way using existing technologies and strategies to entice older people into social and physical participation. They built on the pleasurable experiences framework by Korhonen et al. (Korhonen, Montola, & Arrasvuohi, 2009).The latter team extended the framework offered by Costello and Edmonds (Costello & Edmonds, 2009), which reviewed the pleasurable experience of interactive art, in order to make it applicable for the design of products and games.

Romero et al. considered curiosity, exploration and nurturing as playful mechanisms in order to persuade older people to perform certain activities (social and physical) because these mechanisms entail intrinsic motivation (Romero et al., 2010). They conducted research with seniors living in a care home and aimed to design a persuasive solution that supported "life transitions" such as losing partners or friends, moving to a care facility and / or experiencing the decline of physical and cognitive capabilities (ibid).

They developed the *Activator*, a concept (and not a working prototype), which was based on an existing weekly paper based newsletter and served two main functionalities: activity notification and self-awareness. The activator would use

sensors in the care home to update the screen (which would be in the resident's room) with activities the residents had already undertaken and displays activities that are offered by the home as group activity. By making the resident aware of what she / he had done so far, the resident would be able to decide for her or himself whether she / he would like to be more active and social or whether they would like to rest.

The Activator concept supported playfulness by offering a playful goal-setting feature, a means to compare the star rating with other residents and information on who else takes part in the activity. The activator concept offered mutual motivators by providing feedback on performance on social and physical activities and providing awareness for further community-building and physical activities. Lastly, it supported the concept of life transitions by not directly interfering with people's daily routines, but by blending into their surroundings and by providing awareness on personal activities and those on offer.

Based on this paper I was intrigued by the mechanisms to design for playfulness building on intrinsic values. Reading further about intrinsic values and what feels good for any person led me to believe that having a view into another location has an intrinsic value (M. J. Zimmerman, 2010). It feeds a person's curiosity and allows them to explore. The TV analogy for the design of the TT was aiming to address curiosity but also familiarity to make a person feel secure. I however did not feel that intentional features such as goal setting and star ratings were appropriate for my investigation. I wanted to keep the artefact's proposition as simple as possible.

Further, this paper provided a framework for understanding older people's major events in their life (as described in Chapter 2.2.3), which I subscribe to.

6.2.2 Designing for ambiguity and interaction cues

Investigating the issue of loneliness and older people Sokoler and Svensson discovered through ethnographical research that older people perceive loneliness as a taboo, despite relevance of the topic to their own situation of diminishing social networks (Sokoler & Svensson, 2008). They discuss the challenge of designing technology intended for social interaction, but without singling older people out as lonely individuals, which would be stigmatizing for them. They found that older people preferred social interaction born out or through everyday interactions such as gardening or dog walking rather than social interaction specifically designed to make contact (e.g. meet & greet meetings for newcomers to the housing association). Sokoler and Svensson embraced the concept of ambiguity (W. W. Gaver, Beaver, &

Benford, 2003) for their design suggestion and to avoid stigmatisation through their design.

As an approach they suggested three themes for designing (Sokoler & Svensson, 2007, p.302): ”

1. Allowing room for ambiguity by leaving things unsaid.

2. Utilizing existing everyday activities when looking for enablers of social interaction.

3. The integration of digital technology with other resources for human action.”

With their design they supported to the “ticket-to-talk” concept as introduced by Harvey Sacks in 1972 (Silverman, 1998), in which everyday activities can provide cues to talk with unacquainted people.[37]

Sokoler and Svensson developed the concept for a *Presence remote* control for AmigoTV (Sokoler & Svensson, 2008), which indicated the presence of other viewers, who were watching TV at the same time. The TV ‘buddy mode’ allowed people to signify by pressing a button on the remote control that they are open to interaction. However, by not revealing the channel people were watching, it provided people, connecting via buddy mode, with a starting point for a conversation (or a ticket-to-talk).

Alongside with their design suggestion and research Sokoler and Svensson promoted 3 perspectives on older people (Sokoler & Svensson, 2007):

- *“A perspective on the population of older adults emphasizing that it is a population of resourceful individuals;*
- *A perspective on social interaction emphasizing its circumstantial nature as an inherent part of everyday human activities;*
- *A perspective on the role of digital technology emphasizing its role as merely one of many resources present for human action in the world.”*

I support their perspectives since this was inline with insights I had gained out of my research. The first perspective echoed the views on the life-span developments (see Chapter 2.2.1). The second perspective highlighted the social functions of

[37] Sacks had been criticized by Geoffman that his conversation analysis had a ‘systems engineering’ perspective (Silverman, 1998, p.34). Silverman however, considers Geoffman as misinterpreting Sacks and supports Sacks’ view on having a describing stance on sociology rather than clarifying, categorizing or analyzing. In Silverman’s view Sacks shows that behaviour is rule-guided and not rule-governed (Silverman, 1998, p.35).

communication such as small talk and how it is integrated in the dynamics of people's everyday activities. The third perspective I emphasized when I conducted the storytelling workshops to take away concerns that digital online tools were designed to replace human contact.

I made the TT in analogy to a Television since TVs are a well recognised and part of everyday technology. However, I planned to display the *TV like* TT system in places where older people come to rather than designing a technology for their living room or bedroom.

This would give older people a reason to leave their familiar environments and experience the technology in person and possibly in groups. I considered the event of trying out or looking at the TT as a potential "ticket-to-talk". I intended to keep the information around the TT to a minimum to leave room for ambiguity on what the TT might be and to encourage exploration.

6.2.3 The video window for ludic engagement

Another influential paper for my research was "Age and experience: Ludic engagement in a residential care setting" by M. Blythe et al. presented at the Designing Interactive Systems conference in Aarhus, Denmark 2010 (Blythe et al., 2010). This paper summarized findings from a 2 year-long study at a residential care home where ideas for cross-generational engagement through ludic systems were developed. The research built on the concept introduced by Huizinga with his book "homo ludens" (Huizinga, 1949). The central idea of the book argues that humans are essentially playful creatures.

In contrast to Romero et al.'s research where the activator has been developed employing strategies for playful persuasion to fulfil a goal (physical activities) Blythe et al.'s research concentrated exclusively on ludic activities in cross-generational engagement. They explored ways to engage people's curiosity, diversion and humour rather than building on goal orientated activities that monitored health awareness.

Blythe et al. described though how they constantly had to resist the urge to design something 'useful' and to make themselves think of ideas that were only playful. The multi-disciplinary team developed:

1. video window

2. projected portraitures

3. blank canvas

4. soundscape radio

In opposite to the notion of artefacts based on the "ticket-to-talk" concept - which could have been an exhausting experience for residents - they worked with the "ticket-to-be-silent". The authors introduced the concept of “interpassivity” to describe the 'passive' use of technology by the oldest old (which was not passive, but the obverse of interaction) in those cross-generational uses (Blythe et al., 2010, p.168). Interpassivity can be understood as the awareness and satisfaction of the ability to be able to interact if one wanted to. (The paper offered an example by Zizek, taking enjoyment out of owning a film, which one has not seen yet, but could anytime.)

For the video window, a camera was set on top of the roof and the view was displayed in a picture frame in the main room of the care home. Residents did not spontaneously comment how much they liked it, but they did complain, when staff forgot to switch it on in the morning (ibid.). Gaver, who had a video window in his own home installed over a period of time, reported how he had formed an affective relationship with the outputs (e.g. with the aesthetics of the visual from the view) of this basic live video technology idea (W. W. Gaver, 2005).

The TT aimed to be a platform, or a ‘space’ (Dourish, 2006), which connected two locations, and, through which one could communicate, if they wished to do so. The TT aimed to support the concept of interpassivity by providing a window to the other location where non-verbal communication such as nodding or waving was possible and which is physically less exhausting than having to speak. Still, if a person wanted to communicate through the TT to a person on the other location, they would have been able to. The size and space around the TT was also supposed to encourage small group use. Vom Lehn et al. found that interactive displays in museums frequently catered for individual experiences only (vom Lehn & Heath, 2002), but not for group experiences, although most people tended to visit museums in groups.

6.2.4 Assessing the communication media for social interaction

Considering my intentions to design a system or interface that facilitated social interaction for older people I wanted to understand the effect of different media on our communication when communicating.

Most research into communication media is rooted in organisational and business research and therefore does not directly investigate social interaction[38]. However, some theories provide a framework to assess the differences between the communication media for interaction.

Social presence theory was developed in the 70s and brought in line with recent developments in HCI by Biocca et al. Social presence theory ranks the communication medium by the degree to which it conveys the physical presence of the communicating participants (Biocca, Harms, & Burgoon, 2003; Connell, Mendelsohn, & Robins, 2001; Walther, 1992). Social presence would be seen as low when people interact in computer-mediated-communication (CMC) since there is a lack of non-verbal cues; at least lower than when interacting over the telephone. The telephone, however, would be seen as providing lower social presence than Face-to-Face interactions.

Media richness theory treats the medium as rich when the medium allows the communicators to "overcome different frames of reference or clarify ambiguous issues to change understanding in a timely manner" (Daft & Lengel, 1986, p.560). Media richness theory applies a similar ranking of the media as the social presence theory (Connell et al., 2001).

Connell, however, found that the conversation over the telephone has the optimal blend of media richness to be most effective and satisfying for the participants. In their study they found that people can get easily distracted in Face-to-Face conversations. Since the phone uses only one channel intensively (the audio channel: speaking and listening) participants felt that the total of information conveyed by voice alone (which includes pauses, hesitations, questioning ehms etc.) was enough to allow for clarification or adjustments and participants were more focussed on the conversation (ibid.).

In this table I rank offline and online media by the potential immediacy of getting (conscious and unconscious) feedback from the other person.

Offline	Online
• Face-to-Face • Telephone[39]	• Skype (video transmission over the Internet) • Chat & instant messaging, twitter

[38] Sproull and Kiesler found with their research into social context cues (where they analysed the communication of 513 workers in a large company) that about 40% work-unrelated information (e.g. movie reviews, club meeting, recipes) was exchanged and intertwined with work emails (Sproull & Kiesler 1986).
[39] Here I would like to point out that I regard the standard telephone as a medium to carry out offline social interaction, however when someone has a telephone line using VOIP (Voice Over Internet Protocol) with Skype for example, my distinction between offline and online social interactions becomes blurred.

Offline	Online
• Letter • Postcard	• email • Updating your status update or profile picture • Sharing images, movies, links

Figure 34: Comparison between offline and online media by immediacy of getting feedback

Effective Face-to-Face communication demands greater communicative flexibility and creativity than computer-mediated interaction (Walther, 1992). Due to the constant conscious and unconscious adjustments between the conversationalists one can argue that Face-to-Face communication is more physically tiring than computer mediated written communication. The latter can imply that some people, who lack social competence, might develop a preference for written online communication over offline face-to-face communication (Caplan, 2003)..

Following the idea of finding a communication channel that is instantly rewarding by providing visual and audible feedback I considered live online video connectivity particularly interesting (the interest in instant reward with age is also described in more detail by the socio-emotional selectivity theory in appendix 3.2.3). The live video transmission can be interpreted as media rich and high in social presence. Therefore I conclude that live video transmission is possibly the closest form of online interaction compared to Face-to-Face offline interaction[40].

6.2.5 Conclusions

Since I intended to address older people without computer literacy skills it was important to find out how to get older people (and computer novices) interested in online connectivity. The framework of playful persuasion was attractive to me since it was based on intrinsic values. In particular, curiosity and nurturing were categories I expected to be relevant to older people.

Sokoler and Svensson's research was the first to address the problem of stigmatization by using a design approach based on ambiguity and by incorporating the ticket-to-talk concept where cues for social interaction were embedded in everyday activities. Watching TV was an activity performed by people of any age.

The video window demonstrated how a simple idea of transmitting the outside view, can be very effective in providing people with a joyful and satisfying experience. The

[40] However, research needs to be conducted to assess whether users of online video calls might be the same focused on the conversation similar to a phone call or not.

concept of interpassivity, which implies the option of being able to interact but not to ‘force’ the person, was attractive to me.

With the TT idea, I intended to provide people with an awareness for the other space and where they were able to choose whether they wanted to interact with another person or not.

Subscribing to the concept of homo ludens I intended for the TT to support playful activities, and not to become a tool for the surveillance of older people.

Since I concluded that live online face-to-face interactions were most likely the closest form of communication to the offline face-to-face interaction I was keen to concentrate on online video connectivity exclusively. It was important to me to find the appropriate interaction mechanism suitable for older people in general, but at the same time not to appear stigmatising.

6.3 Literature & technical reviews of projects involving online video connectivity

In this section I present a digestion of the most interesting projects in relation to online video use, social interaction and older people. Firstly, I present two projects looking at the design of an online video calling facility for older people. Secondly, I report on two artistic interventions employing online video connectivity, which inspired me. Finally, I present the increased use of online video connectivity integrated in activities for daily living. Reviews on the use of online video for social (and business) connectivity such as video conferencing and calling, the use of robots for mobile remote presence and the use of online video connectivity in Telehealth are located in the appendix for completeness (see appendix 4.1 – 4.1.3).

6.3.1 Video calling facilities

The design of a video calling facility for older people has been the subject for at least two research projects in the UK. The first one took place in 2011 where Jamie Tunnard, Research associate at the RCA Age & Ability lab, worked in collaboration with Cisco in order to improve the video connection technology to address the needs of older people (RCA, 2014). His research investigated existing video services for opportunities as well as by creating a life size mock-ups he enabled older people to be directly involved in the design process.

> *"The study revealed that older people desire a more engaged and connected experience via a device that is larger than a laptop and more personal than a business video conferencing system"* (Helen Hamlyn Centre for Design, 2011, p.11).

Tunnard took inspirations for the prototype from domestic furniture such as windows, mirrors and picture frames to provide large screen video experience.

Figure 35: Photo of Tunnard's research process (taken on 4th October 2011 at the exhibition)

Tunnards research's supported my intuition to make the TT like a piece of home furniture and to provide large screen.

The Bath Institute of Medical Engineering (BIME) led the InTouch project, which focussed on video telephony for people with mild to moderate dementia. The project took place between January 2011 and June 2012 collaboratively between BIME, the Research Institute for the Care of Older People (RICE), Dr Niki Panteli (University of Bath) and the Peggy Dodd Centre, a Daycentre for people with dementia (Department of Health, 2013). They followed a user-centred design approach with 15 iterative design sessions and built a fully functional prototype, which connected the daycentre with another station for video calling. The interface consisted of a large touch screen with camera connected to a telephone handset (without buttons). This combination of screen and handset appeared to work better than the touch screen interface alone. Familiar with handsets, users with mild dementia knew intuitively how to end the phone call (Boyd, 2014).

Figure 36: InTouch video calling facility - with courtesy by H. Boyd from Designability

I found out about the Bath project after I conducted my rounds of research with the TT. When I brainstormed the volume mechanism I included a handset, but decided against it at the time. My concern was that a handset suggests conversations only between two people rather than in small groups.

6.3.2 2 Examples of artistic interventions: Telematic dreaming and the Telectroscope

The vast majority of artistic interventions have been created in order to make people think or reflect on the specific themes. The following two examples have been chosen in order to highlight specific qualities of the interventions, which informed my decision to continue with online video. Both interventions connected two separate spaces.

6.3.2.1 Telematic Dreaming

Artist Paul Sermon produced for the annual summer exhibition by the Finnish Ministry of Culture in Kaiaani the Telematic Dreaming installation in 1992 (Sermon, 2014). With support from Telecom Finland he used ISDN technology in order to connect to locations, in each of them was a bed, with projections of the audience in each location as if they were in bed (see figure 37).

Figure 37: Visual of Paul Sermon's performance art installation - Telematic dreaming. Courtesy By Paul Sermon (Sermon, 2014)

Using the bed as a metaphor for personal space and intimacy and replacing the sense of touch with seeing the projection of another person created the effect of closeness with other people despite geographical distances. At the same time it catered for members of the audience to reflect on the voyeuristic properties of the art intervention.

In my view this example demonstrates specifically chosen placements and interaction mechanism for online video can create a multi-layered level of feelings of presence (Dourish, 2006). Those technologically mediated feelings of presence could make a person feel more intimate with a tele-projected stranger in bed than meeting a stranger at a bus stop.

6.3.2.2 The Telectroscope

According to the fictional story the artist's grandfather met Isambard Brunel as a child, and since decided to become an engineer. He made plans to drill a hole through the earth and place a telescope through it in order to see what is on the other side, but was never able to realise them.

Artist St George decided to realise the ambition by creating an art installation connecting two places with a live video feed. For the audience, it was a spectacle since a steam punk style tunnel construct 'suddenly' appeared overnight at the riverbank of the Thames and at a pier in Manhattan in New York and stayed there for two weeks before disappearing again.

Figure 38: Photo of the Telectroscope in Manhattan (Serano, 2008)

Inside the tunnels St George used two video cameras linked by a VPN connection to provide a virtual tunnel and view across the Atlantic. The Telectroscope was a success in nurturing relationships between the two parts of the world (The Telectroscope, 2014). People used boards to write messages to each other or used other communications (email, phone calls, text messages) to arrange for meet ups at each end of the Telectroscope.

Although I had not experienced this project myself, I was drawn to the concept and found it fascinating. The Telectroscope installation felt like a construction from Victorian times. The tunnel itself – the steam punk style - was a spectacle for audiences. People were drawn to it by curiosity (one of the playful persuasion mechanisms) and viewing the other location was likely to have fulfilled the intrinsic qualities for curiosity and voyeurism. The art intervention brought people from different locations together.

The Telectroscope was a platform, through which people were able to communicate. Despite the lack of sound transmission, people reacted creatively by using different forms of communications such as gestures or writing messages on the board. The fictional backstory and the limited duration of the intervention are likely to have added to the audience's experience as something unusual, special and mysterious.

6.3.3 Example of online live video integrated in everyday activities

In September 2012 I found out about a practical application for online live video, which was not related to health, online learning or only used on the web. On 18th September 2012 CBC news reported about a bank teller machine that had a live video function integrated in order to assist customers (Adach, 2012). FirstOntario, a banking group in Canada, introduced the first video linked ATM machine in 2010 (First Ontario, 2014). Frontline staff worked remotely and in shifts to provide a 12-hour service (from 8am-8pm) so the ATM machines could be used for any transaction needed. After the customer has scanned their ID, the customer can interact with the teller over the computer screen and phone if they wish so. According to CBC article this service has turned out to be popular with less tech savvy clients, who are frequently also older clients (Adach, 2012).

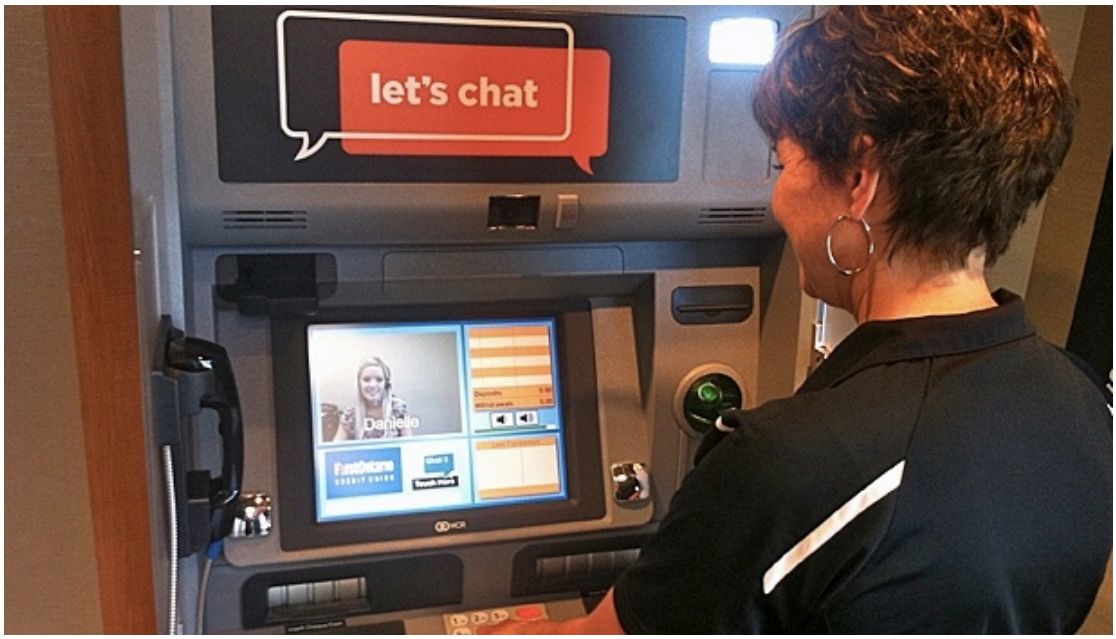


Figure 39: Screen shot - FirstOntario Credit Union bank teller with video technology (First Ontario, 2014)

I was made aware of this after I had conducted my first round of research with the TT. Results of the first in-the-wild intervention brought out how people could imagine having help or information service delivered to them through live online video. A service like FirstOntario's (see figure 39) appeared to be one example of how to integrate online video connectivity into everyday activities successfully. During 2014 further services, such as amazon.co.uk and Barclays have introduced video calling to staff for their online experience (Bischoff, 2014).

6.3.4 Conclusions

Having reviewed the above projects (and those in appendix 4.1-4.1.3) I felt confident to continue with the idea to build the TT. Concentrating on online video only and offering it in an easier to use apparatus than a computer (which would be hidden) meant it could become of interest to anyone who enjoyed a view into another space. Choosing a different form to that of a computer and a simpler interface implied that older people did not need to learn how to use the computer (and mouse and keyboard) in order to be online and to be connected with others. The projects that focussed on video calling facility for older people brought out that older people would like more from video calling than a 'little screen' and that keeping established forms such as the handset helped accepting the newer technology intuitively as well as negotiating the rules of interaction.

An interesting view, an intriguing display or location, friendly Face-to-Face communication can be seen as instantly rewarding in comparison to written online communication. As I discussed with the socio-emotional selectivity theory (Carstensen et al., 1999) immediate reward and feeling good was an important goal for an older person in comparison to investing time in order to learn something they could not see the benefit in.

Inspired by the art intervention projects I considered it important for the TT to be in public places, or semi public, but accessible places, so people had a reason to visit. Public, or semi public places were likely to generate a more interesting view too. The visual transmission allows people to experience the 'atmosphere' of the other place as well as non-verbal communication between people.

The TT aims to be a tool or platform for connectivity between people of any age, but I took the technological novice and the older person's strength and abilities as a design requirement in order to make subsequent design choices.

6.4 Building the Teletalker

My original sketch of an indoor TT as depicted in figure 39 was influenced by the 1970s round style TV.

Figure 40: "Aphelion" TV accessed on 14th April 2012. Courtesy by the TVhistory website (TV history, 2012b)

My wish was to give the artefact a round look in order to appear stylish and to evoke curiosity. However, it turned out that curves for the outside of the screen – or the shell, as I called it at the time - were rather difficult to shape unless I was able to use fiberglass forms, which Middlesex was not able to provide. I had to ensure my designs were achievable in wood, MDF or flat sheets of plastic, so I researched other forms for the shell.

I found inspirations in TV designs from the 1930 -1950s (see figure 41). Due to the chunky and sturdy appearance, similar to a piece of furniture, this style seemed even more appropriate. There was a chance that older people remembered this style of Television from their childhood, in particular considering the reminiscence bump (Glück & Bluck, 2007; Rubin, Rahhal, & Poon, 1998) see also appendix 3.4.3.

Figure 41: 1936 Baird T5 picture accessed on 14th April 2012. Courtesy by the TVhistory website (TV history, 2012a)

Based on the 'Baird' form factor and using principles derived from the theoretical framework (see Chapter 6.2) and literature and literature and project reviews (see Chapter 6.3), the TT kiosk was produced for the in-the-wild research.

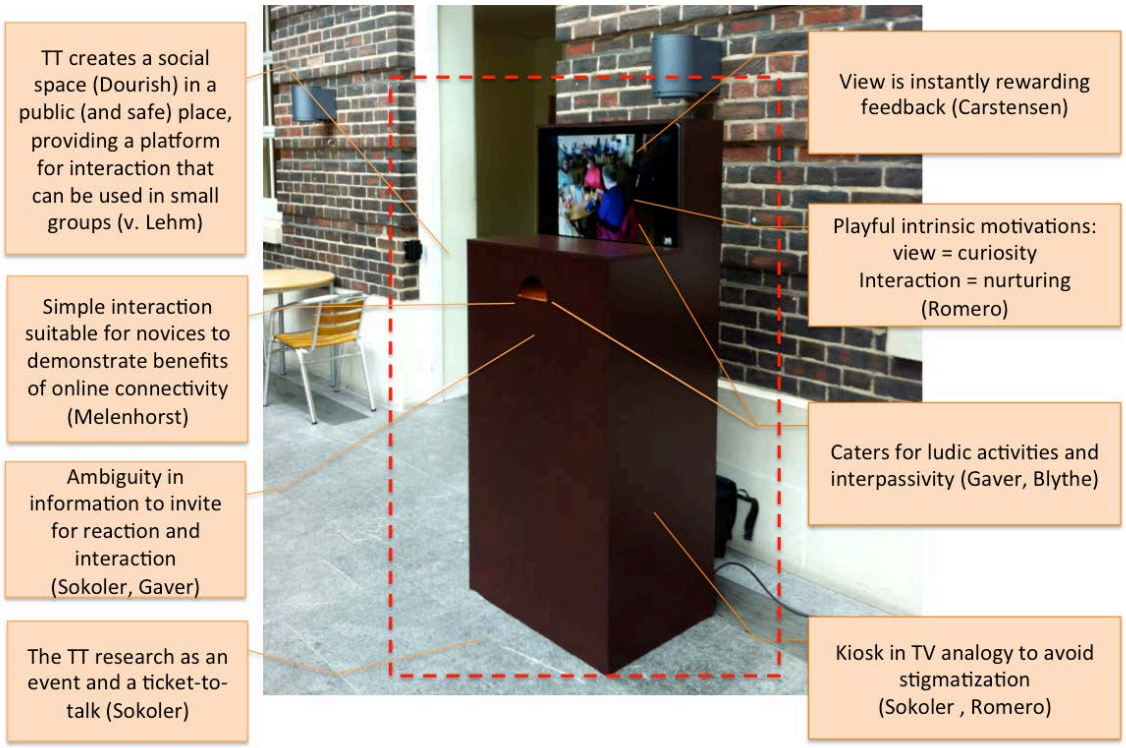


Figure 42: The built TT with theoretical framework annotations

Details of the construction of the TT, including iterations, can be found in appendix 4.2.

6.5 Reflections on building the TT

Building the TT was the way to externalize my vision for an apparatus that demonstrated the benefits of online connectivity. For this I concentrated on online live video as a presence and communication medium, by presenting it in a complexity reducing form (hiding the computer) and using a familiar analogy such as TV furniture. I developed a theoretical framework to support my implicit hypothesis for making the TT as shown in figure 42.

By adjusting the design (form, shape, mechanisms) of the technology, online face-to-face interaction I believed could be made easy and enjoyable for all people (whether they were computer literate or not).

During this first experiment (the construction of the TT) I already had to make trade-offs between my vision, the ideal, and the reality of constructing it, bearing in mind

materials, time and resources. For example, the location for the hand sensor on the first shelf was designed according to guidelines for access to public terminals considering wheel chair users (Gill, 1997; National Disability Authority, 2014). But after having built the kiosk it became clear that the position for the hand sensor was too high; it was uncomfortable to use even for myself.

Since the TT had to be ready for the first round of in-the-wild research, a quick solution had to be found. The fix resulted in a hole being cut in the body of the TT. Now people had to put their hand inside the hole in order to switch the sound on. This was far from ideal and not how I had originally envisaged it, but still better than a hand sensor, where strain in arms and shoulders are likely.

The selection of the hand mechanism was a choice based on the appropriateness for the anticipated audience, technical skills and feasibility, discussed in detail with my supervisors at the time. The choice of hardware equipment was after consultation with Middlesex's Art & Design technical team.

Design Interventions with the TT in-the-wild

In total there were 3 rounds of in-the-wild interventions with the TT, connecting different locations and age groups. Each intervention was different to the previous one in terms of length and people involved. During the interventions returns were collected in various forms. The returns (clusters of direct feedback, notes, observations and experiences) collected were interpreted and some informed direct changes to the TT for the next round and improvements to the intervention set-up. This section concludes with reflections and answers to the sub-research questions.

6.6 First Intervention: Connecting older people with younger people

The first round of in-the-wild research with the TT took place from 11-15th June 2012, when the communal room of the daycentre of Age UK Barnet, was connected through the TT with the entrance hall of Middlesex University (the atrium) in North London. 11th June was the day of set-up and testing of the technology. Returns collection with older participants, Middlesex students and staff took place from 12th-15th June.

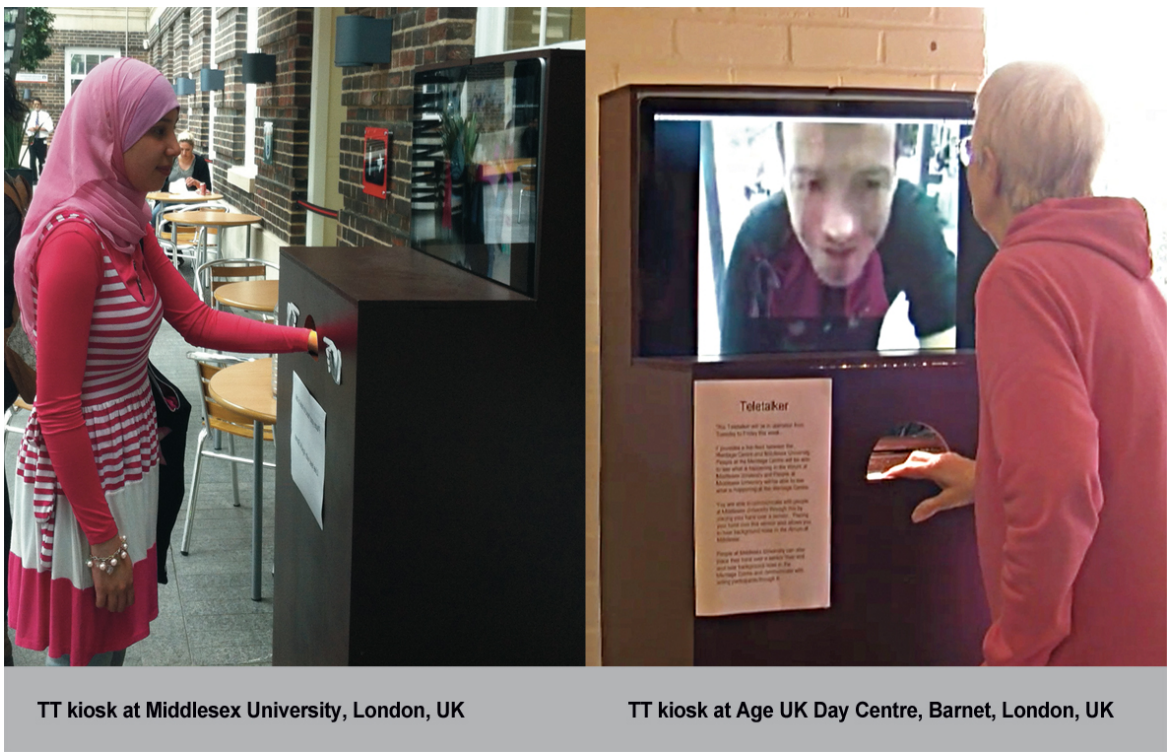


Figure 43: Teletalker kiosks at the intervention's locations

6.6.1 The set-up

Permission to place the TT kiosk at each end had been granted by both organisations and a risk assessment was conducted. Ethical approval concluded that the TT kiosk had to be "manned" by a member of the research team at university's location in order to ensure no misbehaviour towards older people from the students' side.

I had intended not to be prescriptive about the TT research and kiosk in order to keep the research ambiguous and the TT kiosk curiosity evoking. I wondered whether the TT itself could become a ticket-to-talk (similar to as suggested by Sokoler et al. with their research (Sokoler & Svensson, 2008)). However, the daycentre clients at Age UK Barnet as well as their staff and volunteers had to be informed about the research, so I prepared a note where I was careful not to refer to words such as computer and online. The Age UK team placed the information about the upcoming research activities in the newsletter, on notices on doors inside the daycentre, and provided verbal explanations when asked[41].

6.6.2 The daycentre's clients

The Meritage daycentre was open to older people from Tuesday to Friday (9:30-3:30pm) with an average daily attendance by 35 clients. Clients were regular visitors who were given lunch whilst on the premises. The majority of the daycentre clients were over 75 years old, with no computer experience and had some type of mobility impairment. In line with the UK demographic development, where the trend shows women outnumbering men by 2:1 when over 85 years old (ONS, 2013), there was a greater number of female clients than male clients.

In this particular centre there were two regular groups of clients attending the daycentre. One group visited on Tuesday and Thursday, the other group visited on Wednesday and Friday. The centre further offered activities and services, where infrequent visitors could also join in such as concerts, gymnastics, welfare advice, and computer classes.

[41] The information was also fixed onto the TT kiosk as shown in figure 43 in the daycentre's location. At the university's location, I realised in the afternoon that I had to offer signage to entice people. To gain attention with the TT I placed the printer's finger pointing towards the hand sensor and a sign "feel free to try". This was my quick fix to be curiosity evoking rather than informative.

6.6.3 The kiosks' locations

Both kiosks were set up at their locations and each of them used the local WI-FI connection to run Skype. In the large atrium, coming from the main entrance, the TT kiosk was placed halfway on the right hand side, near the wall.

This position was chosen in order to be close to a main power plug socket, and to be central to provide a good overview of the space (see figure 44). In the daycentre community room the choice of the location was based on the nearness of the main power socket, not being in the way, and also on the view the TT could capture.

Figure 44: Map of the campus with the 2 positions of the TT kiosks during the intervention

On 15th June 2012, both kiosks were moved to different locations. At Age UK the kiosk had to be moved into the hallway, due to objections to have the TT near her table by one opinion leading daycentre client. In the atrium the TT kiosk was moved near the central walk through.

6.6.4 The research team and methods of returns collection

For the 4 days of research I had scheduled support from my 2 supervisors, from 2 members of the technical team (to take video recordings) and two friends, who were intermittently available. My intentions were to collect returns through observations, feedback sheets, and exit interviews after the use of the TT. I also planned to take video recordings on how people used the TT with consent by participants.

The reality turned out to be different to my expectations. I expected that students and staff members were curious and because of their curiosity they would come and try out the TT. I imagined being able to stand back (or sit) to observe students and staff

while they spoke and interacted with clients at Age UK daycentre. However, by lunchtime of the first day I realised that information and signage at the university's location was needed for explanation otherwise people seemed to be cautious and stayed away (see figure 45). I further realised that I needed to stand right next to the TT - like a sales person or demonstrator -, firstly to explain to people at the university end, what the TT did and how it worked and, secondly, to be a conversation partner when an older person at the Age UK side decided to try it out by placing their hand on the sensor. Since this change of level in involvement was unexpected, my note taking became ad-hoc and opportunistic.

Figure 45: TT kiosk with signage at Middlesex University

6.6.5 Returns from the first Intervention

Acting like probes (see Chapter 4.2.5) I argue that with TT in-the-wild interventions the research addressed the social science, engineering and design goals. Through the intervention I learnt about use (behaviour) and users (attitudes and motivations) for the social science perspective. From an engineering perspective people reviewed the suitability of the technology and the hand mechanism with the natural interaction. The intervention with the TT inspired users as designers for future placements, applications as well as for form and style improvements. I interpreted this feedback from a design perspective.

My note taking was diary style, which meant writing down an observation or experience as soon as I noticed it as noteworthy. In line with the interpretivist paradigm, I went through my notes, added a further layer of interpretations to the written observations and reflected on which goals they addressed (see appendix 4.6 collected returns).

I cannot claim that my note-taking was exhaustive or complete. Knowledge and insights around the research were also gained by simply being there. I tried to take in as many returns as possible since I did not yet know, which significance they might bear, at the same time I applied reflection-in-action, where I gained insights and adjusted my role or intervention set-up accordingly (e.g. added signage on the first day).

Embodiment is a key word for the experience of conducting research in-the-wild. Embodiment is "*concerned with the social and physical context of the body in structuring cognition and how the world is experienced*" (Rogers, 2011, p.60). The concept of embodiment is based on a multiplicity of influences, mainly from phenomenology (Winograd's and Flores's discussion, Suchman's, Gibsonian, Dourish's, Heidegger and Merleau-Ponty's), but also on pragmatism (Dewey, Wright & McCarthy). With in-the-wild research the process of sense and decision-making in real life is in focus.

The full list of the returns can be found in appendix 4.6 for now I highlight some major insights. This round brought out from the **engineering perspective** level that the hand mechanism was not intuitive. Most people expected the sensor to act as a switch rather than a contact point (hand on = sound on, hand off = sound off). The mechanism was learnable, but the mechanisms' affordances (J. J. Gibson, 1986; D. A. Norman, 1999; Turner, 2005) were unclear.

On the **design goal level** some older participants made suggestions, but the majority of comments were from students (but this could also have been because I was the majority of the time at the university's location).

Students suggested employing the TT in the service and information industry (e.g. train time information, MacDonalds Drive thru), to connect different countries, switching views and camera angles. The style and look of a jukebox was proposed to modernise the kiosks' look and feel, as to something that young and old knew.

The older participants, who were members of the Colindale club but not members of the daycentre, imagined that their club could be connected with places like the library. The daycentre clients, who had tried the TT, did not offer any design suggestions as such.

Figure 46: 3 Women from the Colindale club using the TT

The returns I gathered on the **social science goal** level were rich and complex. I learned about people's attitudes towards video connectivity, trying out novel things (the TT and the hand mechanism) and interaction behaviour between young and old. Not surprisingly, the younger the person was the more likely she / he was curious and wished to try things out. I gained further insights about the daily activities in a daycentre and about daycentre group dynamics (see collected returns in appendix 4.6). From reactions at the university's side, it became clear that people didn't know what older people in a daycentre did. On the one hand there was curiosity around the view into the other world by university staff and some older people. On the other hand there was hesitation when people did not know what it (the research, the kiosk) was about. Those who had been informed about the research through the newsletter and knew that the TT was based on a TV analogy came especially to see the set-up. In contrast, one opinion leading daycentre client reacted with objections to the TT (as described in appendix 4.6 – day 2), which meant that I had to keep the TT switched off for the day and had to change the location of the kiosk on the last day.

Some interactions through the TT between the generations were video recorded. I analysed this material to study further the dynamics and content of those exchanges (see following section 6.6.6). The edited video clip highlighting some conversations through the TT during the research can be found here[42] (Markowski, 2012c).

[42] https://www.youtube.com/watch?v=Ucoy6pm3wyI

Figure 47: The new position for the TT kiosk in Age UK's hallway on Friday 15th June 2012

6.6.6 Conversational content of TT interactions

A count of 27 conversations through the TT had been noted down. The majority took place between members of the researching team and with a daycentre visitor. 8 conversations took place between students and daycentre visitors. There were high noise levels at the university due to building work (which I had not been informed of) and the technical issues with WI-FI and Skype did not help the conversational flow.

In total there were 7 conversations through the TT that were filmed. I reviewed those conversations in regards to the type and themes of spoken content, although with difficulties due to poor sound quality on the video recordings. I wanted to understand whether the TT had become a ticket-to-talk during the research, (i.e. would participants speak about the TT when speaking with a stranger?). Following the method of thematic coding (Robson, 2011, p.465ff) the content was divided into 4 groups:

1. Conversation about the TT e.g. "What do you think of this (machine)"?
2. Small talk e.g. "Where are you from?", "Are you having a nice day?"
3. Reminiscence e.g. memories of the Hendon college site 30 years ago
4. Future directed personal questions e.g. "Will you get a job when you have finished?"

Analysis of the 7 conversations showed that small talk (J. Coupland, 2003b) took place most of the time. It was observed how the social aspect of small talk was more important than the content. People were laughing and smiling at each other. In my view small talk and making each other smile can be understood as a playful use of the TT.

Analysis further found 4 instances of reminiscence; two of those were referring to wartime experience. There was only one instance of a future directed personal question asked by a daycentre client to a student.

Conversations about the TT through the TT only happened at three noted occasions. A member of the researcher team prompted two of those. In this respect I conclude that the TT did not work as a ticket-to-talk in itself during research.

The transcription of the recorded conversations can be found in appendix 4.5.

6.6.7 Feedback on the intervention

Considering my goal of designing something that facilitated online social interaction for older people, it can be said that the TT in-the-wild did generate interaction and communication between younger and older people. However, this required facilitation by a member of the research team to either introduce the older person to the student or help out with the use of the hand mechanism. The article below, written by the Age UK team for their newsletter, summarises the introduction of the TT as a success.

Talk to the TV

Have you ever thought of speaking to someone through your TV? In June Age UK Barnet and Middlesex University invited older people and others who were interested to do just that through Teletalker, with resounding success.

Created by PhD student Marianne Markowski, the Teletalker, designed to look like a 1930s TV set, provided a live 'window' between Age UK Barnet's Meritage Centre and the atrium of Middlesex University.

Those who used the Teletalker at the Meritage Centre really enjoyed the intergenerational interaction with people at Middlesex University, sharing snippets of each other's lives and chatting to people they wouldn't otherwise meet during their day.

The Teletalker successfully introduced older people without computer literacy skills to online technology, giving them the opportunity to have a look at what was going on elsewhere, or to press a button and start a conversation.

Age UK Barnet looks forward to helping Marianne further with her research and developing the Teletalker.

Figure 48: Article from the Age UK Barnet newsletter - Issue: August 2012

6.6.8 Lessons learnt for the next in-the-wild intervention set-up

This round brought home how difficult, time and labour intensive it was to conduct research in-the-wild. One most obvious lesson was that the TT kiosk needed

signage to tell people what the TT was about, where it connected to and how to use the hand sensor.

Secondly, having moved the TT kiosks into different positions on the last day, it showed the significance of the kiosks' placement and the view seen on screen. Even though there were technical difficulties with the sound on the 4th day, the view of seeing the daycentre clients leaving for the bus attracted interest from students. The higher interest was likely due to the more prominent position of the TT kiosk next to main walk way and to see people on the screen moving.

Figure 49: TT kiosk on Friday 15th June 2012 in a central location at Middlesex University

Another lesson for future rounds of research was to consider a person to be permanently at one kiosk in order to ensure a conversation partner was available. This of course meant finding a person (or several) that would be available for the duration of the intervention, apart from myself.

Also, the technical issues around controlling the sound on the opposite computer, and technical issues with WI-FI, Skype and the sound needed to be addressed in order

to ensure a well-working demonstration of the TT concept. Before discarding the idea of the LDR hand sensor as too novel and not intuitive enough, I wanted to review how the current mechanism could be improved.

In the following next 6 months I worked closely with my supervisor and with a programmer friend to address the technical issues of sound control and controlling the volume on the other computer (see appendix 4.3ff).

6.7 Second Intervention: Connecting younger people with younger people

The second round of in-the-wild research took place from 6th -14th December 2012 at Middlesex University. The TT connected the 2nd floor of the Grove building with the cafeteria on the 1st floor. Although the TT was designed with an older person's capabilities in mind, the concept was supposed to be age neutral. In this respect research with anyone of any age was considered as useful in order to verify the concept as a tool for evoking curiosity and playful interactions.

Before the intervention could take place, technical and hardware iterations took place including a complete re-write of the connecting software controlling the volume on the *away* computer. These iterations are described in appendix 4.3.1 and 4.3.2.

6.7.1 The set-up

On 6th December 2012 I was scheduled to give a presentation about my research to the Middlesex postgraduate community at the Art & Design Research Institute in the Grove Building of Middlesex University. This was a great opportunity to demonstrate the TT to fellow researchers and to get their reactions. Afterwards, it was planned to leave the TT set-up for in-the-wild research with students and staff. A risk assessment and ethical consent was sought and this time it did not require a member of research team to man the kiosks as there were not the same ethical concerns.

After the demonstration one TT kiosk was left on the 2nd floor and the second kiosk was placed in the Grove café location. The TT kiosks remained in their positions until 14th December 2012 before they were moved to the 3rd experiment's location.

The kiosks were switched on for use on 7th Dec, 10th Dec and 12th -14th December between 11 and 4pm.

Figure 50: TT kiosk on the 1st floor near the cafeteria in the Grove building

6.7.2 Methods of returns collection

In this round I did not have a team to help with conducting the research. In addition, I had other commitments leaving me with limited time for direct observation. The TT kiosks were switched on in the mornings by myself and shut down by a member of the technical team in the afternoon. This was time for students to explore the TT naturally without my involvement or observation (but had the drawback that this interaction happened unrecorded). Apart from collecting returns by observing and interacting with students through the TT when I was present, I left short feedback questionnaires with the kiosks. Furthermore, I video recorded two students enacting the familiar use of the TT (see Chapter 6.7.4).

6.7.3 Returns from the 2nd Intervention

I collected returns and analysed them depending on the goal they addressed (social science, engineering or design goals). The full list of returns can be found in appendix 4.6. In addition, this intervention brought out strategies the researcher can

employ during in-the-wild research to generate interest in their research and to get people to try things out (see 6.7.4).

Similar to the first intervention, on the **engineering** level, returns made clear that the hand mechanism was not intuitive despite available instructions. Also the intermittent issue of poor sound quality remained, alongside background noises, which had a negative effect on the overall experience.

From a **design** perspective, returns showed that there was positive interest in the concept of connecting various university's locations visually. Considering students found their own way of communicating non-verbally through the TT (e.g. holding up messages), it left me wondering whether they felt sound was needed or not.

From a **social science** perspective I expected the students to be more curious and to spend more time actually trying the TT, but found this not to be true (at least when I was present). It seemed that a potentially interested person needed instant feedback of what was going on (e.g. someone waving or speaking through the TT) otherwise she / he did not bother to try out the TT further by speaking into it and waiting for a reaction.

Another interesting **social science** return was confirming how people project their needs and interests onto the artefact. For example, a member of staff praised the TT on the second floor because it was a good way for him to check the length of the queues at the café. Another lecturer was excited about the TT research since it reminded her of the "Hole in Space project"[43].

6.7.4 Strategies to involve people during the intervention

When I was in the process of switching the kiosks on, the TT kiosks received a great deal of attention by students and they wanted to know what I was doing. As I needed someone to accept the Skype call at the other end, I involved students at two occasions asking them whether they could accept the incoming call in a moment. By engaging them I was able to get some initial reactions to the concept.

[43] In 1980 Mobile Image, Kit Galloway and Sherrie Rabinowitz connected New York and Los Angeles with two life size large screens fixed at a shopping mall and at an arts centre in the centre (Struppek, 2006). It was an artistic intervention, which was set up between the two locations without providing people with further explanations. The intervention was very popular with residents and they spread the news word of mouth. On the third day a "mass televisual migration of families and trans-continental loved ones, some of which had not seen each other for over twenty years" took place (Electronic Cafe International, 2014). I was pleased with this comparison since it reflected the inspirations I had from other art projects (i.e. the Telectroscope).

I also figured out that groups of students in front of the TT had the effect of generating more interest with other students who were further away. I took advantage of this phenomenon and rather than addressing single students I would intentionally speak to groups.

On a particularly quiet day, 10th December, I spoke to a group of students (they were 1st year film students as it turned out) who were standing in the Grove café area. I asked whether they could help me with my research. I explained that I had built the TT, but that my supervisor, who lived near Brussels at the time, had not seen the latest working version and how students used the TT. I asked them whether students could use the TT while I take short video recordings with my mobile phone with their consent. I asked for a video recording for two scenarios:

1. The first one was about the students using the TT for the first time (i.e. their natural interactions)
2. For the second recording I asked them to act as if the TT was a usual way of communicating for them.

Two students agreed to help out, the others came along to watch. Both video clips can be found on YouTube:

First use of the Teletalker[44]: (Markowski, 2012b)

Acted use of the Teletalker[45]:(Markowski, 2012a)

In the 'first time use' video the students commented how they felt strange because people were looking at them for using the TT. This of course will always be an issue for novel technology that is being tried out in-the-wild.

In the 'acted' video it was noticeable how they used (one handed) gestures to assist their communication. They waved to each other when they said goodbye. It brought home that the hand sensor as it was, was a restriction to using both hands.

6.7.5 Feedback on the intervention's set-up

Since I was mostly by myself in this intervention set-up, so direct feedback from others on the set-up was limited. However, two questionnaires were filled in anonymously. I took their answers as an overall support for the ludic qualities of the TT concept.

[44] https://www.youtube.com/watch?v=AQq7g-Z_IrQ
[45] https://www.youtube.com/watch?v=jHZrWqwNSGA
Unfortunately, the background noises from the coffee machine in the café made it difficult to hear the conversation in the second video (acted use).

There was also criticism on how the intervention was set-up. The second respondent's experience could have been improved by making this person feel more involved in research and by "not just putting it (TT) there".

Questions	Respondent 1	Respondent 2
1. Was there anything you particularly liked about the experience?	It's funny	Random communication
2. How could the experience be improved?	The sound was not very clear. It took a while to understand. Cool.	By observing who makes connections and whether location is a factor and whether casing is a factor and basically testing and analysis, not just putting it there
3. Where would you like to see the Teletalker placed in the future?	It feels like Harry Potter. Haha	Between two disparate groups say: old people / young people Mosque / church Birth clinic / funeral pastier

Table 3: Table of two questionnaire responses

6.7.6 Lessons learnt for the next in-the-wild intervention set-up

Lessons were learnt from this round, but because there was little time before the next planned TT intervention took place between the two daycentres, I was not able to address every aspect.

One of the major lessons was that a person was always required to be present at one kiosk at least. This person needed to invite and encourage people to try the TT, demonstrate the hand mechanism and provide background information on the research as well as being an interaction partner if someone spoke through the TT at the other location.

Well-designed information material, signs and instruction messages were essential. Ideally, the design of the information materials would be inline with the visual style of the TT. My paper print outs did not convey the messages properly and people did not pay attention to it. I would have liked to have included a 'bitter chocolate' coloured headboard with instructions or prepared more colourful signs, emphasizing certain words. Or provided instructions in a laminated or otherwise durable format, but time and resource constraints were against me.

It became obvious that the hand sensor was too unusual for people and that more guidance in how to use it was needed; or that the hand sensor needed to be replaced with a different interaction mechanism that was the same easy to use, but with clearer affordances (J. J. Gibson, 1986; D. A. Norman, 1999; Turner, 2005). Again, time constraints abstained me from developing a new mechanism, but with having a person at each location for the third round I was hoping to overcome the initial learning curve for the hand sensor.

The duration of the intervention was another factor to be considered. With a novel artefact (and a prototype prone to performance issues or sound problems) it appeared to make more sense to demonstrate the TT to people and then let them have a go. This type of exposure should be planned to be shorter in length than an intervention, which leaves the research tool for exploration by people themselves. Due to practical considerations (such technical performance, information needs for participants) this is in contrast to Kurvinen et al.'s conditions for sufficient time span and openness, see Chapter 4.2.4.

The following section describes the third round of in-the-wild research, where I connected two north London Age UK daycentres. From lessons learnt I decided to concentrate on a one-day intervention with the TT kiosks being manned at each side.

6.8 Third intervention: Connecting older people with older people

The third intervention differed from the first two because it connected older with older people and due to the seasonal context I expected older participants to wish each other festive greetings ('Christmas' as a ticket-to-talk).

6.8.1 The set-up

On 18th December 2012 the TT connected the communal room of the daycentre Age UK Barnet with the communal room of the daycentre Age UK East Finchley, London. The daycentre clients were informed about the day through notices (see 4.4.1), the newsletter and by staff mentioning the research to them.

The length of the research got reduced to one day: firstly, so it would be perceived as an event, which provided a unique opportunity, and secondly, to find helpers for the research team more easily.

Figure 51: View of the communal room at Age UK East Finchley

6.8.2 The research team and returns collection

In total there were 5 helpers at different times, mainly because it was too difficult for people to be available for the full day (9-3:30pm). I briefed them verbally and had documentation prepared, explaining what I expected them to do (e.g. inviting daycentre clients to try out the TT), what to look out for (i.e. what was important to observe) and what to do when they had to restart the computers in case of a technical problem. I planned to be with one helper at the Ann Owens centre while there was a rota for the 4 helpers at the Meritage centre.

Each daycentre had approximately 35 to 40 daycentre clients attending. Both daycentres had their independent entertainment program on Tuesdays. At the Ann Owens centre there was carol signing in the afternoon and the Meritage centre had a choir visiting them. Overall, I identified 3 time slots in between activities, appropriate for interaction between daycentre clients through the TT.

Since most Meritage centre clients were already familiar with the TT, I had prepared a mock-up for an alternative sound mechanism. It was a box with a simple red button. My helpers at the Meritage centre were supposed to concentrate on the form and the design of the hand mechanism. With the mock-up they were supposed to elicit feedback, whether a button might be more appropriate and how its size and colour worked for them.

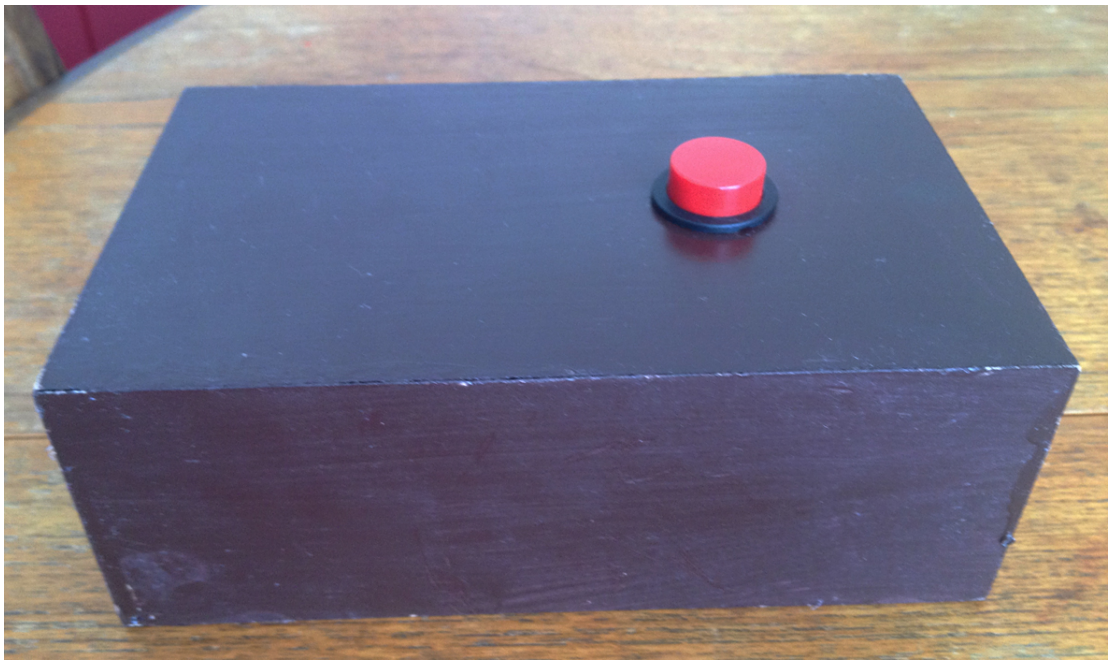


Figure 52: A box with a red button

At the Ann Owens daycentre the intention was to gather feedback on the overall TT idea. A simple questionnaire, including a question on current computer and Skype use, was prepared. The questionnaires were supposed to be distributed at both daycentres at the end of the day. I further brought seasonal decorations for the TT and 2 tins of Quality Street sweets to be shared out as thank yous.

6.8.3 The location and kiosk set-up

On 17th December, one TT kiosk was set up in the corner of the communal room of the Ann Owens Centre in East Finchley and the other kiosk was set up the Meritage Centre in the same location as previously used. However, due an event at the Meritage centre, which I was not informed about, I was not able to test the TT functionality.

I further renewed the signs for the TT kiosks, explaining which locations they were connecting. A cardboard in shape of a handprint was added to the area where people were supposed to place their hand to cover the 3mm hole.

Figure 53: TT at the East Finchley location with view into the Meritage Centre

6.8.4 Returns from the 3rd Intervention

This third round started with technical difficulties. There was an initial WI-FI connection problem, leading to problems with the sound volume and timing. Since the Meritage and Ann Owens centre were a considerable distance apart and my helpers were not familiar enough with *arduino* and *processing* programing I had to go for and back between the two locations to assess the issue.

After several variable adjustments and computer restarts, the issue was still not solved. At lunchtime I decided that it made more sense to continue without sound. The visual connection still enabled daycentre clients and staff to wave to each other. However, the technical issues in the morning most likely resulted in negative impressions, which led to a lack in interests by the daycentre clients.

Considering the technical difficulties affecting the intervention's set-up, it can be said that the returns I collected were mainly from the **social science** perspective. Through conversations, I found out that some Ann Owens clients were not keen on interacting with the Meritage clients because they felt that the Meritage centre had received more attention in regards to resource allocation (e.g. more exercise classes) see collected returns in appendix 4.6, 2nd intervention.

The visual connection worked for staff members, who were very pleased to wave and mouth messages to fellow staff at the Meritage Centre. According to one research helper, there were two daycentre clients at the Meritage centre, who were patiently waiting to communicate through the TT and left disappointed.

Around 2:30pm I started to distribute the forms to the Ann Owens clients. It became obvious that filling in the form was a difficult task for most daycentre clients. At least 6 clients were physically or mentally not in a position to fill in the form alone. Others stated that they preferred to fill in the form at home. But I never received any forms back despite checking with staff weeks later.

Only one person filled in the form instantly. He was a current computer and Skype user. To the question, what he particularly liked about the experience, he wrote: "*I think the idea is excellent as it enables people to be in visual and oral contact at Christmas and other important times*". As suggestion he wrote that the TT could be placed on "*some sort of tracking as used in film sets*", with the intention that all people in the room could be involved in the view.

6.8.5 Feedback on the intervention's set-up

Overall, the experience was disappointing and frustrating for me, for the research team and for daycentre clients and staff, who were keen and curious to try the TT out.

However, there were some positive aspects to be taken out of the experience. There was generally positive feedback around the idea of connecting two locations audio-visually. Although interest in connecting to the other daycentre varied between daycentre clients and staff, the TT's visual connection and the questionnaire were useful tools to learn more about the specific clientele, their attitudes and their abilities.

Research helper Charles summarised his experience in an email:

Hi Marianne,

Just wanted to follow up from yesterday. I wish I had been able to do more and been a bit more active earlier on. With some hindsight I would have walked around and introduced myself to people independently of the project rather than standing in the corner feeling a bit tied to the machine. I have to say I wasn't quite prepared for the level of interaction the situation needed and this is partly down to having rushed straight in from other work.

Nick was very good at rounding people up and getting them involved but unfortunately it was quite difficult to know how best to handle the situation. I hope that you managed to get some good feedback from your end at least and that even an outcome like this can contribute somehow to your research.

I found it very interesting to observe people interacting when it happened. For the most part people were positive about the idea. One person commented that it was an interesting idea but was reluctant to interact as she "wasn't very nosy" in her words - I think that had something to do with it being a window into the other space without any direct interaction as there was nobody facing the camera at the time. Other interaction was very difficult to judge as it was obviously coloured by absence of audio and later very heavy image compression. It was difficult to rouse enthusiasm among participants because of this and I think Nick for the most part did not think it was worth getting people involved until we had established an audio connection. There was a definite expectation of audio from most people involved. We did have someone come up to us from your end (not sure if you observed) who was waving extremely enthusiastically at us.

I have to say from the experience in the Hendon campus as much as this I found the speakers difficult to make out (I have some mild hearing loss, music related) and was wondering if some external speakers (as opposed to the built in iMac ones) might be more appropriate, and also given your feedback issues an external microphone. I imagine you are considering this. Nick had also pointed out that he might have liked an obvious microphone, even a dummy one to know where to speak into.
Also and I'm sorry I'm sure you have considered this- the keyboard and mouse were not accessible for easy maintenance and I wondered if a Bluetooth set might have worked better.

I found the situation of connecting the two rooms interesting in itself and especially due to the similarity of the settings really did feel like it was more like a window into the other space. I could see how the project would work and I really hope you have some more success next time. Thanks for inviting me to come down and participate.

Charles

Figure 54: Email from research helper

Another helper, who had joined at the Meritage centre for the last 'shift' provided verbal feedback. He suggested for next round of in-the-wild research to have a "dedicated performance team".

He suggested that this was key to building up a relationship with the daycentre clients in order to feel comfortable to ask them questions. Since he had missed the events from the day I understood that he found it futile to hand out questionnaires to older people he did not know, asking about their views and experiences, which he had not witnessed and where he could not support them filling in the form.

6.8.6 Lessons learnt

From this round I learnt that it was absolutely vital to test the equipment in the location beforehand[46] and to have a plan B for when technology fails[47].

I could not agree more with the idea of having a dedicated research team. However, the reality of limited resources at Middlesex at the time meant that I had to make the best with what I had got. Conscious of people's time I had already compacted the intervention into one day. In hindsight I should have insisted on key people spending a shorter day at the locations rather than working with a rota. The questionnaires, as I intended to have these filled in by daycentre clients themselves, were not a suitable way to capture people's feedback due to impairments (tremor, eye sight), which were not obvious at the first glance. However, the questions on the form appeared to be a useful starting point to ask about the TT concept and experience in dialogue.

In hindsight I should have spent less energy on sorting out the technical problem, and spent more time chatting to the daycentre clients about the TT concept, the window into the other location and to capture feedback this way (see guidelines and considerations for conducting empirical research with active and vulnerable older people in Chapters 9.5 and 9.6).

6.9 Reflections on the interventions with the TT

There are many uncertainties with in-the-wild or in-situ testing (Crabtree et al., 2013; Jambon & Meillon, 2009), which makes it difficult for the researching team to conduct the research. The research team needs to deal with ad-hoc situations and opportunities, whilst considering what to look out for and taking in what could be relevant to the research in that moment. In-the-wild research offers a lot more 'natural data' than lab research and at times can prove that concepts developed in

[46] Because Age UK Barnet had volunteered the space for research in the daycentres and my main contact worked part time, I did not want to complain about the situation that I was unable to test the day before since Age UK Barnet were doing me a favour in the first place.
[47] To date I still have not figured out what exactly the problem was, but Roy suspected that the WI-FI connection had varying speeds leading to the erratic sound transmission. We were not able to re-create the problem in order to investigate it further.

the lab are very differently interacted with in the real world (Rogers, 2011). This is where I had to adjust my theoretical framework and my implicit assumptions.

Each time the TT was set-up for in-the-wild research, people were able to evaluate the TT concept and design by trying it out and experiencing it. The 3 rounds of interventions differed immensely in their set-up. The placements (and views) of the TT changed, the length of exhibiting the TT, the communication around and people involved in the research differed as well as the methods of data collection. The TT kiosks were only slightly modified between rounds. The kiosks together with the TT concept and myself were the only constants in the rounds of research.

With each round I collected returns, which I interpreted from an engineering, design and social science perspective. The last round generated foremost social science returns due to technical difficulties.

Overall, I learnt through these rounds how to set-up an in-the-wild interventions involving video connectivity with prototypes in two locations. The first intervention, even though I tried to consider every eventuality, was my first trial in how to conduct research in-the-wild..

The first intervention brought out several important aspects, which I tried to address with the subsequent rounds (such as adding speakers). But most importantly it brought home how involved as a researcher I had to be with the participants through the TT.

The second intervention differed immensely in the research set-up in so far that I had no research team for support and only limited time to observe. Leaving the TT for students and staff to explore was a very different in-the-wild set-up to the first one. Despite the facility, not many people interacted through the TT (at least not observed or recorded). I developed strategies for involving people that I consider as useful for other in-the-wild or showroom researchers, who work with prototypes that connect different spaces and people. For example, it was useful to approach groups in order to evoke interest to try the technology out or to involve bystanders during the set-up of the technology (see Chapter 6.7.4).

I reflected on why so few interactions were generated during the second intervention in comparison to the first one. Firstly, it appeared that a person to interact with was absolutely necessary otherwise the person trying out the volume mechanism would not notice the effect of the volume being switched on at the other end. Since I was not able to be always present to cater for potential interaction, it was likely that people had lost interest, when no immediate response or feedback was given. In this respect the suggestion of “on air” lights was attractive to me.

Secondly, people might feel “strange” when they try out something novel and other people can see them. Trying something new in ‘public’ (i.e. in front of other students), where one is unsure how to use it, can be stressful because no one wants to look ‘silly’ by potentially making mistakes. It would have been helpful if I could have demonstrated more frequently how the TT worked. It was noticeable how there was always interest in the TT when I switched it on or off with students asking me questions on what it was and why it was there.

At the same time, the notion of the ‘public’ being able to see how two people engaged with it also worked the other way round. If there was a group of students in front of the TT kiosk it was likely to generate more interest from onlookers and bystanders to see what was going on. I gained the impression that it was more suitable to seek small groups of students asking them to try out the TT in order to generate interaction through the TT.

Comparing this to the first intervention, daycentre clients as well as students were assisted by the research team in how to use the TT. The presence of the research team may have given them security and justification (i.e. helping the research) for trying something new, rather than curiosity alone.

Thirdly, the view of the TT was not so interesting in the second intervention. Looking into a daycentre with completely different people was likely to evoke more curiosity than the hallways and areas of a building that students and staff knew anyway. Nevertheless, despite the audio functionality not being fully explored by students and staff, the view into the other space appeared to be the most attractive aspect of the TT to students and staff, who gave feedback. This was particularly apparent with the member of staff commenting on how he judged the length of the queues for the coffee bar by looking at the TT kiosk on the second floor. He used the TT as a visual information tool to make decisions on whether to buy a coffee now or later.

Fourthly, despite instructions in place, staff and students seemed not to read them, or the instructions were insufficient and unclear. It looked as if students preferred to learn through verbal explanation or by working it out for themselves. Overall, the hand mechanism seemed too novel and too unusual for students in order to use it effectively. This observation was inline with the returns I gathered from the previous round of research with daycentre clients and university members. It became clear that the hand mechanism as it was currently designed did not work.

Finally, considering I was not able to be present the majority of the time, the impression emerged that there was not enough contextual information provided around the TT research leaving staff and students wondering what the kiosks did. On the one hand

it could be argued that this was curiosity evoking and the ambiguity raised interest levels. On the other hand since it was the pre-Christmas period and students were on campus with limited time, it might have been likely that those students who were wondering about the TT did not invest the extra time and effort to find out more about the kiosks mechanism. In hindsight, if I had prepared description sheets explaining the experiment and provided more information around the TT's purpose I might have gathered a greater response from students and staff during their time on campus.

With the third round I tried to synthesize my experiences from the previous intervention set-ups. I intentionally reduced the length to one day in order to secure helpers more easily and placed the event into the festive season to offer an incentive for interaction. Daycentre clients were informed about the research through notices and a newsletter article. The kiosks were supposed to be manned at each side, but each location had a different focus on what people were supposed to evaluate. It was disappointing that the technology failed on this particular day.

Most importantly all the interventions brought out how the TT was a general research tool, without a specific purpose other than connecting people for social interaction. To achieve social interaction, I provided them with a platform, which offered a view and possible audio connectivity, if they wanted to. For audio connectivity to be experienced one of the TT kiosks had to be manned, otherwise people did not have a conversation partner. I had little control over the social interaction between two people unless I was one of the conversation partners.

The chance that two strangers would independently go to the TT kiosks in different locations at the same time and start a conversation was highly unlikely. The latter was something I had not fully thought through and I was naïve to imagine that I could observe social interaction from a distance. Reality proved that I had to be involved with inviting participation and explaining the research intentions.

The lack of purpose was in the first and particularly noticeable in the second round of research. However, this lack of a clear purpose for the TT, this ambiguity, I argue, could also have inspired people to offer practical suggestions for the use of the TT e.g. helpdesks in department stores.

6.10 Reflections on the theoretical framework for the TT

The complexities of setting up and conducting in-the-wild research with novel technology for a complex setting makes it difficult to validate the theoretical framework directly. Although researchers have research questions to guide their attention, the relationship between research questions, the theoretical framework for building the artefact and conducting interventions is not a linear one. As discussed in Chapter 3.3 the research questions address more than the experiment or intervention can answer to. Experiments and interventions are conducted within a program. In my case, the program is my theoretical framework and the realm of constructions for online video connectivity.

The theoretical framework informed my expectations around the use of the TT and needed to be re-evaluated after each intervention. After the first round I found that *ambiguity in informat*ion around the TT did not work. It seemed more effective to inform and to invite people as it happened through the Age UK newsletter. Three women from the Colindale club had read the TT description, which compared the TT to a "talking TV", and made the effort to come and see it. In this respect I would like to draw comparisons to the artistic intervention with the Telectroscope, where the fictional story (or narrated story) formed part of the appeal for the intervention.

The first round of research also brought out that the notion of the TT being a *ticket-to-talk in itself* did not work. Although people spoke about the TT through the TT, it was neither the opening nor the focus of the conversation. Small talk was the dominant form of exchange. The spoken content might have appeared trivial, but small talk needs to be considered as a form of nurturing, where people exchange in order to form bonds.

Providing a view into the different location was something new and curiosity evoking. This can be said for all locations, the university and the daycentres. But this 'watching view' elicited negative reactions by one daycentre client, unfamiliar to the research on the second day of research in the first round. She didn't want to be seen or overheard. Through this situation I learned about daycentre clients' behaviour towards opinion leaders. This brought out the need to build trust with key people in order to conduct research.

The second in-the-wild intervention confirmed the ludic qualities of the TT with feedback mainly based on seeing the other space rather than using the audio. In this round I expected younger participants to be more spontaneous in trying out the TT than they

actually were. My view was informed by observations from the first round and readings about different learning styles observed between younger and older people. With increasing age people adopt a more reflective and observant learning style (E. Truluck, Bradley C. Courtenay, 1999) in contrast to hands-on learning when younger.

In the last intervention I already applied an adjusted theoretical framework. I considered the season and possible festive greetings as a starting point for interaction to nurture the ticket-to-talk concept. I avoided ambiguity by ensuring information about the research was provided with notices displayed and in the Age UK newsletter (see appendix 4.4.1). The views the TT provided were into similar spaces, where also a festive program was taking place and where staff and some clients knew each other.

6.11 How does design journey 2 (DJ2) address the sub-research questions (1-4)?

The following section addresses the 4 sub-research questions:

6.11.1 DJ2's contribution to sub-RQ1

How do older people currently undertake online social interaction?

This question was not directly answered by the 2nd design journey since the design interventions did not address this question, other than offering older people another way to try out online social interaction. From the literature review I was aware of statistics, which supported my argument for concentrating on online video connectivity and building the TT. The 2010 ONS Internet Access report showed that the number of older users who "telephoned or made video calls (via webcam) over the Internet" was nearly double with 15% in comparison to 8% of older users "posting messages to chat sites, social networking sites, blogs" (ONS, 2010, p.14).

6.11.2 DJ2's contribution to sub-RQ2

What are the design considerations when designing online technology for older people?

With this design journey I kept the target group as wide as possible including active and vulnerable older people. The TT was tool for social interaction with people of any age. The TT was built to demonstrate one of the benefits of online connectivity, namely video connectivity to people, who were not familiar with it yet. In this respect the design choices for the hardware and interaction mechanisms were guided by the abilities and strength of an older person (who are the majority of computer novices now).

Design guidelines for public access terminals (Gill, 1997; National Disability Authority, 2014) were followed when deciding where to place the hand sensor, but in reality this position turned out to be too high to reach comfortably.

By concentrating on a concept for a tool that connected places and people of any age, I tried to avoid the stigmatization trap. Considering the interaction generated between older and younger people during the intervention and the feedback I collected this design strategy appeared to have worked.

I chose to work with the TV analogy to present the 'new technology'. Firstly, since everybody was familiar with using a TV and the TT kiosk design built on this familiarity. Secondly, the sturdy appearance of the TT and the size of the screen provided a raised and large view into the other location. The hiding of the computer worked well in, so far that older computer novices were willing to try the system out. The space around the TT allowed usage in small groups, which was useful for a collective experience (e.g. 3 women from the Colindale club, a group of students) and which could be compared to TV viewing experiences.

The choices of placements for the interventions (the first and third) invited people to come and try out the TT with people at the other location. I intentionally gave the TT no other purpose than 'playful' social connectivity, addressing intrinsic motivations such as curiosity and voyeurism. When people interacted with each other through the TT, the small talk can be argued to have served the intrinsic motivation of nurturing, which effectively addresses the feelings of social cohesion i.e. we are all part of a larger group.

During the interventions the TT represented a design proposition for a social space where people of different ages were able to engage with each other, but without a 'ticket to talk' (or a reason) the interaction between two people still needed to be facilitated by the researching team. During these interventions feedback on the concept, hand mechanism, form and future proposition for the TT was collected. The communication around the interventions i.e. before and during the intervention played an important role to inform and also entice people to take part.

6.11.3 DJ2's contribution to sub-RQ3

How may new online social interaction technologies be made suitable for adoption by older people?

As described in the previous section I considered with the making of the TT strategies for acceptance of live online video technology by older people. I created not only a connection between two locations but *a social space* where people could communicate through (Paul Dourish, 2006b). To make it more suitable for adoption I chose to connect different generations thus promoting the concept as age-neutral.

Having constructed the TT I wanted to see how people interacted with it (and through it) in real settings and what (implicit) meaning they created with it. I brought the 'new

technology' to places where older people came to, so they could try it out in a safe environment.

For the first in-the-wild intervention the placement choice was to connect the Age UK Barnet daycentre with Middlesex University's atrium. The TT intervention was communicated to the daycentre clients and Age UK newsletter readers as an event, for groups and in an accessible public places. For me it was important that participants came to see the TT because they were curious and interested. (At the university side I did not communicate the proposition of the TT in the same way, since I believed (at the time) in design ambiguity. The lack of communication in this case did not work. It resulted in creating signage for the research during the research otherwise people were hesitant to interact.

Bringing the technology to people through an in-the-wild intervention can be challenging. Through the TT interventions where I collected returns - rather than facts that confirm or disprove a hypothesis - I gained insights by applying 3 research perspectives: on the design, the engineering and the social science level. I also learnt about setting up in-the-wild interventions and realised how unpredictable and resource (time, people, technology) intensive this research approach was.

One noteworthy observation from the social science perspective was the group behaviour by daycentre clients when one person showed opposition to the TT research. Her reason was that she did not feel informed enough (she had missed information notices) and did not want to have a screen or monitor switched on near her. By daycentre staff she was describe as an opinion leader in the room and when her judgement was against something others would simply follow.

If I were to repeat a similar intervention in a similar setting I would speak (more directly) with the staff beforehand about personalities I should pay close attention, explain my research intentions and convince the opinion leaders, since their opinion influences other people's. In this respect a strategy for technology adoption (or openness) would be to work with the opinion leaders in the room.

Another important strategy to increase the willingness for trying novel things is to ensure that the person, contributing to the research, feels involved. Two returns from my interventions were particularly notable. One was the change in attitude by a sceptical Age UK volunteer, who warmed to the TT concept & technology through Mozart music and became the main interaction partner on that day. The other was the return on the questionnaire with the second intervention; the person criticized the fact that I had just left the TT there.

During the in-the-wild interventions I further developed strategies to involve students (see Chapter 6.7.4) and considered a seasonal approach to initiate interaction (i.e. wishing each other festive greetings) through the TT.

6.11.4 DJ2's contribution to sub-RQ4

Which elements of a method make it suitable for researching new technology with older people?

Constructing and externalising an idea, which incorporates implicitly or demonstrates explicitly a hypothesis is a very useful way for the design researcher to make their thinking tangible. However, the path from the idea or vision to actually building it as a working prototype involves re-interpretations, compromises and trade-offs. Depending on the materials and size of the prototype, the effort put into constructing the artefact can be immense. Therefore it is important to have an early review or assessment by people representing the target audience in order to understand whether the construction is suitable for its purpose. In short, do the reviewers get what the design researcher tries to do? It needs to be noted that depending on the design style i.e. creating an artefact for provocation, reflection or for improved use that the reactions by the reviewers need to be interpreted accordingly.

In the TT research I implicitly worked with the sub-question of 'how do I design online video connectivity for older people that demonstrates benefits of online connectivity with an intuitive interface'. Taking Rogers' in-the-wild research example on board (Rogers, 2011), which highlights the need to focus on the dynamics around the artefact, my implicit sub-question could be re-formulated to: "What is the interplay between live online video technology, interface and interaction mechanisms, views into locations, as well as behaviours and attitudes by older and younger participants around the proposed artefact?" The returns I reported on in Chapter 6.6.5, 6.7.3, 6.8.4 demonstrate the complexity and multi-layeredness of the feedback I collected and which addressed this complex implicit sub-question.

As discussed in methodology Chapter 4.2.3 there are many challenges with conducting in-the-wild interventions around the duration and location, enticing people to take part, forms of returns capture, technological reliability as well as the issue around ethics, health & safety. One of the most difficult challenges is to interpret what is an important observation and whether this return had something to do with the particular intervention set-up or with the concept in general.

When I conducted the in-the-wild interventions I also used short questionnaires and video for returns capture. The questionnaires I found mainly useful as a prompt for dialogue with older people. In the daycentres the older people were a mix between active people with different levels of vulnerability. I needed help from staff to make a judgement on the dimension of vulnerability and capabilities. Speaking with the person alone did not make it clear whether a person was able to fill in the form. As it turned out some of them had significant tremors or such bad eyesight that writing was difficult for them.

The video recording was a more suitable way of returns capture, although more intrusive and intimidating. The older participant had first to sign a consent form and then was asked to have a conversation through the TT. Not many older people rushed to the opportunity to take part and be filmed; most of them had to be gently persuaded.

In-the-wild interventions can be interpreted as live events, where anything can happen. In the particular case of technology failure I wonder whether the TT may have had the opposite effect. Rather than demonstrating the benefits of online connectivity, it could have provided an argument for not using online technology (i.e. doesn't work, too complicated). In this respect the design researcher has to make a judgement about the stability and reliability of the technology and whether it is worth bringing new technology to older people or not, otherwise the intervention might have the opposite effect.

Chapter 7

7 Design journey 3: TW

The chapter starts with describing my activities to create an empathetic understanding of the care home residents and their surroundings. This is followed by the description of the making the TW in regards to design choices, iterations and software development. It further reports on the experience of introducing online video connectivity to residents. As the third part of the journey, the chapter reports on the TW intervention at Age UK East Finchley. The chapter finishes with reflections and answering the research sub-questions.

7.1 The context

The task to adapt the TT for care home use was a specific product design challenge with a specifiable target audience. The considerations for user-centred iterative design were followed. Since vulnerable elderly people may not be able to express or articulate their needs and desires, I worked closely with the KIT volunteers and care home staff to understand and interpret reactions.

I was still building on my theoretical framework, which I had developed for the TT, but with modifications. The thinking around ludic engagement, interpassivity, a view satisfying curiosity on an intrinsic level as well as the concept of instant feedback in online communication was still relevant. I tried to find a suitable and familiar analogy for the physical design of the TW, like the TV was for the TT, but I had to consider trade-offs, which are described in appendix 5.1 – 5.3.

I discarded the ticket-to-talk concept or using intentional ambiguity as a design resource. The latter would have led to unnecessary confusion with elderly residents and volunteers. The entry point for a conversation was initially not needed since a volunteer was supposed to introduce the resident to the TW. The long term vision of the TW was to be a window between care home lounges where the residents could see and interact with each other, potentially without the help of a volunteer.

7.2 Collecting design requirements for the Telewalker (TW)

In January 2013 I started to brainstorm the requirements for the TT considering the care home residents. To learn more about the residents and their surroundings I joined the KIT team as a volunteer at Wellesley Road and Ingestre Road.

7.2.1 Joining the KIT volunteers

The KIT volunteers came one or two afternoons a week to a care home. They invited residents to join them in the main lounge in order to play music and videos through the KIT computer. In the larger care home, Ingestre Road, they went around and spoke to the residents who stayed in smaller lounges and who could not to join in.

My visits to the homes were insightful. I learnt about the residents, who were in their 80s, 90s and 100s, - individually - and about their abilities. I observed from other volunteers how to interact with the individual residents, how to involve them whilst being aware of the potential exhaustion or confusion it could cause, particularly when someone had dementia. I gained insight into the residents' environment, learnt about the staff and their facilities.

The following is a short description of a typical KIT afternoon in one of the two care homes based on notes from my visit on 14th May 2013 at Wellesley Road.

7.2.2 Description of a typical KIT afternoon

In the main lounge I met two KIT volunteers and seven residents who came to listen to music through the KIT computer. (Note: all names are changed)

- Ruby, from Ireland, in her 90s was reminiscing about the first years when she came to London.
- Valerie, in her 80s mild dementia, she used to be a concert pianist. She wanted to dance to the music and show off her legs.
- Joseph, in his late 70s, sat on a chair nodding to the music.
- Patel, originally from Pakistan, in his late 80s, he loved sitar music.
- Anna, in her 90s, sitting next to Patel, was very quiet and softly spoken.
- Flora, 101 years old, told me about her younger sister who turned 81 last year.
- Harry, in his 80s, used to be a jockey, was also reminiscing about his past career.

With the exception of Valerie, the residents needed support with getting up, sitting down and could not move easily around. Although they were all speaking English, the clarity of their speech was reduced, partly due to the lack of strength in their voices, accents and mild impairments. Our conversations usually started with exchanging names, then I would tell something about me, my family or my research. Next, I would ask them about themselves, what music they liked or what they used to do. Conversations easily drifted into reminiscing about their past with pauses extending between sentences. One could see that speaking was effort for most of them. At times we would just smile at each other, listening to the music or laugh at a Charlie Chaplin video clip on YouTube. Sitting next to each other and simply holding hands was also enjoyable for them.

7.2.3 The desire for human touch

At Ingestre Road I met Elisabeth, who was 102 years old. She was sitting alone in a lounge with the TV on. Jeremy introduced me and she took my hand, only to hold it. After a couple of minutes, when both our hands had warmed up, she used my hand to stroke her face. This was an incredible experience for me. I had never felt the smooth and papyrus like facial skin of a centenarian before. Her actions showed how much she just wanted human contact and in her case, simply the warmth of a human touch.

7.2.4 Conclusions

My visits to the care homes brought home that the desire for physical human contact and in particular touch was strong with people, who achieved an old age. It was a poignant reminder that TT could only offer a different way – an online one - to view and interact with the world, but never replace the feeling of another human sitting next to you.

Still, the idea of offering a social space, consisting of a view and a novel (and playful) way to interact with others in another lounge, was an opportunity to be explored.

The visits made it clear that the TT kiosk needed adjustments in order to be suitable for the care home residents. Care home staff were cautious of over-strenuous interactions caused by people they did not know. It was very important to build up a relationship with care home staff, volunteers and the residents to gain trust. It was an advantage that Jeremy introduced me to people initially.

7.3 First experiment - Designing the Telewalker (TW)

The following describes my decision-making process on the design requirements and choices. Building a physical prototype meant making trade-offs between what was ideal and what was feasible or possible. I had to review the kiosk's shell and the hardware used, in particular the hand sensor, to make it suitable for the residents. I further intended to create bespoke video connectivity software as an alternative to working with Skype, where unexplainable issues with sound quality and connection occurred.

In the subsequent months I was working on exploring options for these considerations. The full development is described in appendix 5.1 - 5.3. But the main changes were as follows:

A computer desk with wheels was chosen to make the TT movable, and so it could be wheeled in front of residents. I chose a computer desk with wheels because residents at Ingestre were already familiar with computer equipment on wheels from the KIT team.

I continued working with two different interaction mechanisms for the volume mechanism; one was a large button, the other used a proximity sensor based on infrared. With the large button I supported the residents' conscious effort to speak and be heard. With the proximity sensor I intended to investigate whether it was preferable that the volume came on automatically.

A bell was added to the TW hardware and software based on a suggestion by care home management. The bell served as a means to call for attention at each away location.

An app employing webRTC was developed in order to replace Skype and to overcome sound and connectivity issues. However, during the development of the app, it became clear that sound issues were the greatest challenge in developing such an app (see appendix 5.5 for a full description of the technical development).

The app's interface was designed to be very simple using a microphone icon to indicate when a person could be heard and a bell icon when the bell rang, see figure 55 below and appendix 5.5.3 for a description of the app.

Since there was a lack of WI-FI coverage in the care homes I decided to work with dongle to ensure online connectivity (see also appendix 5.5.5).

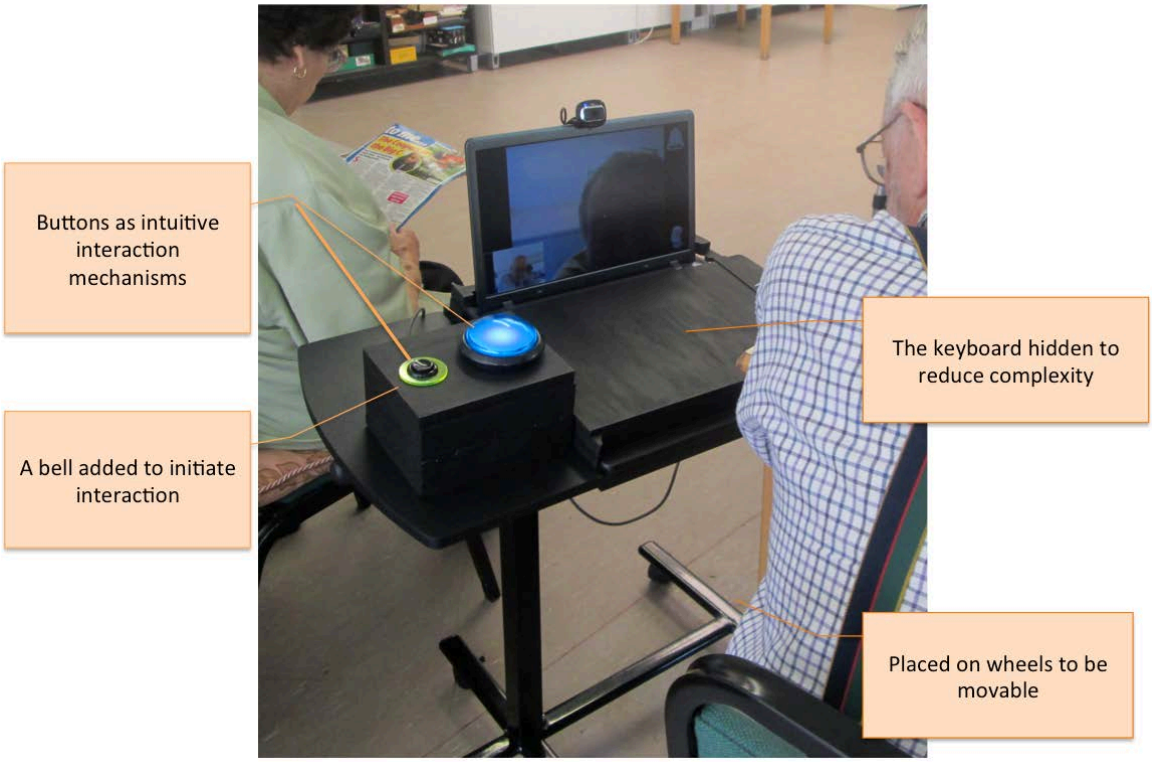


Figure 55: The TW's interface with button box

7.3.1 Reflections on building the TW

Since the TW emerged out of the TT – one could argue as a sister product - the process from conception to construction was more straightforward. In many ways it was an adaptation of the TT in its form and portability. The TW research arose out of an opportunity of collaborating interests. Through KIT I was able to work with the care home manager of Ingestre Road, in Camden. This research activity had a clear brief and a specifiable target audience. I considered Moji, from the care home management, and Jeremy from KIT as my main clients, and the KIT volunteers as my helpers to conduct the research.

I visited the care home locations and met the residents in order to understand their world. This empathetic knowledge helped in making design choices for the construction of the TW.

I steered the build of the TW and supported the development of the TT software, but overall the process can be described as a social one, where discussions, reviews,

compromises and trade-offs took place. Time and financial constraints did not allow sourcing vintage tea service trolleys (see appendix 5.1). Uncertainty around the type of laptop available for research made programming and designing the laptop cover more challenging.

Meeting with the care home management and KIT resulted in the first iteration of the initial design, namely adding a bell (see appendix 5.4). This simple suggestion felt like a suitable answer to the overarching problem of how to get people to interact through the TT. Pressing the bell indicated that a person at one location needed attention.

My indecision around the sound mechanism was mostly based around an internal debate in my head whether it would be better to consciously switch the sound on – as sign of being ready to speak – or to have it automatically come on when the TW detects a person's position (see appendix 5.4.1).

In regards to developing the TT software, the most unexpected and tricky challenge was the sound problems associated with online video connectivity (see appendix 5.5.4). The variations in why and how the problems occurred were manifold and frustrating. It made me realize that the TT app will most likely never go beyond prototyping stage, unless major developments happen in working with open standards such as webRTC.

7.4 Introducing residents to online video connectivity

From the beginning of April the intention was to introduce the residents to online video connectivity by using the existing KIT equipment and Skype. For this I needed to install Skype on the KIT computer and a camera. This turned out to be more challenging than expected, because the KIT volunteers did not know the administrator password to install new hardware and software. Camden Council's technical team was contacted in regards to the WI-FI connection, but they took time in getting back to us. The following reports on the occasion where video connectivity was successfully brought to the care homes.

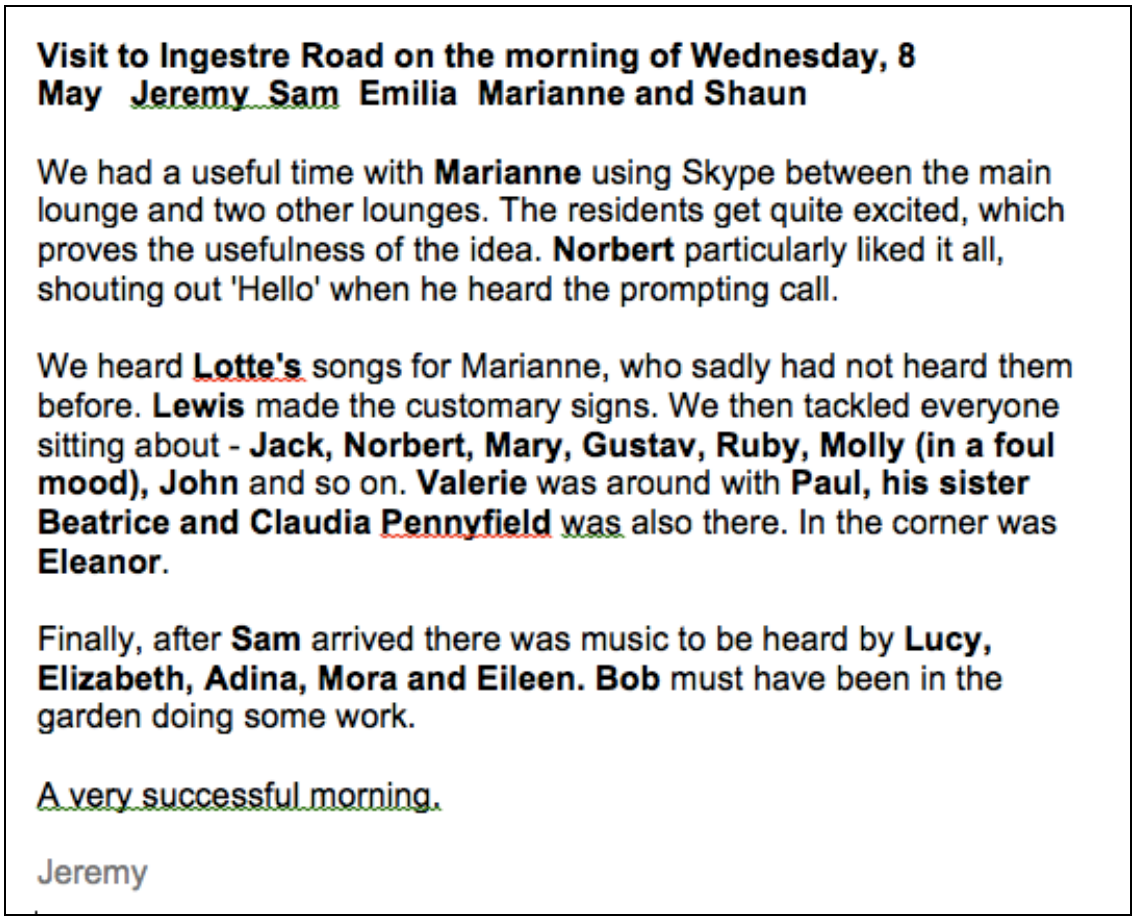
7.4.1 Residents skyping at Ingestre Road

On 8th May 2013 Skype was finally installed on the KIT computer at Ingestre Road. Using a dongle for my laptop and the KIT computer in the lounge connected to WI-FI we were able to connect the two computers via Skype. Jeremy and I walked to the smaller lounges with my laptop, while other volunteers stayed in the main lounge to be available for interaction.

Figure 56: Jeremy with Eleanor (name changed), 93 years old (photo taken on 8th May 2013)

The residents, in the smaller lounges, seemed overall interested in the video connection. Some interacted more, some less energetic, through the live video feed with other volunteers and residents. They waved and smiled into the screen, while we held the laptop and explained what we were doing. One issue was the volume level. The highest volume setting of my laptop was not particularly loud for a large room. Considering that most residents had hearing impairments, it was difficult for them to hear each other. But judging by their reactions (i.e. smiling and being interested) it appeared that the visual connection was rewarding in itself.

The main KIT volunteer always sends an update email to the other volunteers about the last activities at the care home and who took part. The following update email was sent by Jeremy on 9th May 2013. (Names of volunteers and residents have been changed, apart from Jeremy and myself).



Visit to Ingestre Road on the morning of Wednesday, 8 May Jeremy Sam Emilia Marianne and Shaun

We had a useful time with **Marianne** using Skype between the main lounge and two other lounges. The residents get quite excited, which proves the usefulness of the idea. **Norbert** particularly liked it all, shouting out 'Hello' when he heard the prompting call.

We heard **Lotte's** songs for Marianne, who sadly had not heard them before. **Lewis** made the customary signs. We then tackled everyone sitting about - **Jack, Norbert, Mary, Gustav, Ruby, Molly (in a foul mood), John** and so on. **Valerie** was around with **Paul, his sister Beatrice and Claudia Pennyfield** was also there. In the corner was **Eleanor**.

Finally, after **Sam** arrived there was music to be heard by **Lucy, Elizabeth, Adina, Mora and Eileen. Bob** must have been in the garden doing some work.

A very successful morning.

Jeremy

Figure 57: KIT's email summary of activities

Unfortunately due to technical issues previously at Wellesley Road (I couldn't install the camera, nor Skype) we ran out of scheduled KIT afternoons before the planned move into the new location. The decision was made to wait until the move to the new facility in Maitland Park had taken place and to continue when residents were settled in the new location.

On 10th July 2013 I took the opportunity to present the TW at the Maitland Park care home to the volunteers (see appendix 5.6), but unfortunately not to the residents since another event (a mass service) took place.

7.4.2 Conclusions

Overall my experience of intending to introduce care home residents to online video connectivity was, with one exception, flawed with issues around the technical set-up and the availability of scheduled KIT visits. However, the feedback was promising from the afternoon at Ingestre Road where we had showed residents the laptop with the view to the main lounge. During my visits I continued to learn more about the individual residents and the organisational structure of care home management. This experience will have prepared me for any future dealings with care homes. Jeremy used to say “nothing goes fast in a care home” and how one needed to be persistent in order for management to take notice of “good work”. Jeremy considered the new manager of Maitland Park as someone who could potentially be open to new ideas (such as the TW), but she had to finalise and digest the move first before we could approach her.

7.4.3 Reflections on the immersive design process

Designing for elderly people was different to designing for the general group of older people (which included active older people) because the elderly residents were vulnerable and fragile. The need for understanding them, their context and surroundings was even greater because they were not necessarily in a position to articulate their wishes and needs.

In order to conduct the research I needed the support from staff and KIT volunteers who had an established relationship with the residents. A relationship with the elderly person, who might participate, needed to be built up in order to understand what could be expected and where the limitations lied for this person. In this respect it would be best to have a consistent research team and not to introduce new faces into the research.

Through the TW research I learnt about the residents individually, but more importantly I learnt about the culture of a care home. Insights around the management’s use of resources, the daily schedule and activities were gained. Through previous KIT visits to other care homes I also noticed the difference between a privately run and a council run care home. In the council run care home the staff count was higher and time was less precious, although not in abundance either.

The TW was likely to be used in pairs of twos or more people at the beginning in order to introduce the residents to the video technology. Using the TW in small groups I expected to nurture social interaction offline and online. The visual connectivity between lounges could be described as a ‘window of opportunity’. Relating this to the concept of interpassivity, a resident would have the option to look at the TW screen, and possibly interact, if they wished to do so. The TW’s view into the other location was supposed to provide the awareness and the opportunity for doing so. Unfortunately, I had not the chance to conduct an intervention with the TW at the care home due to changes in management at the time.

The ethical dimension (Kinch, Groenvall, Graves Petersen, & Kirkegaard Rasmussen, 2014) needs careful consideration, particularly when conducting research in a care home. For example, I took one photograph during the research of Eleanor and Jeremy using the computer and Skype. At the time I asked Eleanor whether it was ok to take a photo and she happily agreed. But to ensure that her consent was valid I sought for permission from “higher up” before using this photo. Being an outsider (and not knowing Eleanor too well) I was not able to make the judgment whether Eleanor was in a position to give full consent for using this photo for research purposes or not.

7.5 In-the-wild intervention with the TW at the Age UK daycentre

When it became official that the TW will not be tried out with residents before the co-design design workshop on 11th July 2013, I looked for a different opportunity to get feedback by real people similar to the target audience. Lisa Dubow from Age UK confirmed that TW could be tried by daycentre clients on Tuesday 9th July at the Ann Owens Centre in East Finchley.

7.5.1 Detailed Intervention set-up

The research team consisted of my supervisor, Dr Magnus Moar, and myself. The intervention's duration was from 10am until lunchtime (12:30 / 1pm). Since this was a limited amount of time I concentrated on getting feedback on the TW with the button mechanism only (rather than swapping the TWs around). A router connection was used instead of relying on Age UK WI-FI connection.

Magnus stayed with the infrared TW in one room at the front of the centre, while I rolled the other TW inside the communal room and invited clients to have a go. The daycentre had approx. 30 clients on this Tuesday. I showed those who were interested the volume & bell mechanism and then let the person speak to Magnus through the TW.

The returns collection was kept minimal since the intervention served the purpose to get a flavour for the reactions on the TW as a product. This flavour informed the narrative around the TW in the showroom (see Chapter 8.3). Returns collection took place by note taking, photos and by simply being there.

7.5.2 Intervention's returns

Overall there was positive interest in the TW. In total 13 daycentre clients spoke through the TW with Magnus. One crucial aspect that needed to be kept in mind when observing was the fact that the TW was not designed to be used in a daycentre like a video chat system, but it was intended to be presence software with a bell. The TW was designed to offer a view into the other care home lounge and with the facility of a bell to call for attention in the other location. Its design allowed staff to wheel the TW to a resident, who wished to have a conversation or a closer look. Therefore this experimental set-up did not validate the TW for this scenario, and therefore the

functionality of the bell and volume button was not needed as such. However, feedback on the properties of the mechanisms and on the concept of video connectivity in general could still be collected (see appendix collected returns 4.6 TW intervention).

Figure 58: The TW during the intervention at Age UK on 9th July 2013

On the **engineering level** the intervention brought out that the button box interaction mechanism (i.e. switching the sound on rather than keeping your hand on the sensor was more practical for natural conversation flow). The arcade and bell buttons were suitable in size for the audience. Even a person with arthritis in her hand felt comfortable using the buttons. But the on air light on the button box was too subtle and appeared not to be noticed. The bell mechanism worked well (but was not needed for this set-up of the intervention). The volume level was sufficient for one to one conversations. But for a second listener it was difficult to hear considering the large room's background noise levels.

From a **social science** perspective the concept of video connectivity (through a machine that could be rolled to you) was popular. Daycentre clients interacted through it, speaking naturally with both hands free to move, and with smiles & enjoyment (see figure 59). The latter had also to do with the fact that Magnus as a conversation partner seemed popular. This leads to interesting questions on around

the role of the researcher and more specifically what characteristics the researcher may bring into the in-the-wild testing (see also Chapter 9.4 and 9.5).

Furthermore, some daycentre clients remembered me from previous visits with the TT research, which meant that trust had been built up and I was able to engage them more pro-actively in the research. For example, I had a conversation with three women, who I met at the previous round of research and who appeared envious of the Meritage centre's resources. The women saw no point in trying out the TW because they thought it connected only from one room to another (as this was the set-up at the daycentre) when they could still walk. After I informed them of the TW's functionality as audio-visual connectivity for potentially greater distances, they were more open to the concept. However, since some of them were current Skype users, they didn't see any need for a TW for themselves.

Figure 59: S. spoke using her hands freely with Magnus

From a **design perspective** returns confirmed that hiding the keyboard helped those who were fearful of computer technology. One person, who had not used a computer before, felt comfortable using the TW for video communication because she did not need to worry about pressing the wrong key by accident. Being able to wheel the TW to person made access to trying out video connectivity easier than during the TT interventions. By bringing the technology to the person where they sit (and daycentre clients have their preferred seats), meant that mini demonstrations took place in

different locations of the room, causing the person sitting next to them to experience a flavour of it too.

Another interesting design return was the situation, when the bell of the TW was misused like a child's noisy toy. When the TW stood in the hallway without direct supervision, a woman, who appeared to have mild dementia, kept on walking around the TW and pressing the bell. A similar scenario could be likely in a care home, where some residents were prospective to have dementia. If the person were not able to stop, then the design must offer an easy option to suppress the bell sounds, which staff could turn on.

7.5.3 Feedback on the intervention

Apart from the returns collected and our embodied experience as researchers, there was little feedback on the intervention itself. The interest, enjoyment and the smiles can be interpreted as positive feedback on the intervention.

The greatest issue around the intervention set-up was, that it could not validate what the TW was actually designed for, i.e. for use as presence software in care home lounges. The use of the router and the proximity of the connected room also caused confusion for some daycentre clients.

7.5.4 Lessons learnt from this intervention

This round of interventionist research was comparatively straightforward and easier to conduct in comparison to the other rounds. Reducing the length of the intervention, being in one location, using one reliable connection between the TWs and having one dedicated member to interact with made the research set-up significantly easier. It also helped that trust had been built up through previous research activities. Daycentre clients started to remember me and I was familiar with the location and faces.

Considering that this intervention did not fit the TW's design goal and the target audience exactly, the returns collected have to be considered with this skew in mind. The example of the woman with early dementia persistently pressing the bell happened when the TW was left for a short moment unsupervised. In order to validate its likeliness to happen in a care home lounge, I would need to conduct in-the-wild interventions in the care home. Since interventions in-the-wild are resource, labour and time intensive, and prone to unexpected events happening, the

researcher needs to make a judgement call whether the intervention is worth her / his / their time. In regards to this round it was definitely worth our time because it still validated choices in form and design.

Considering the size of the communal room and the background noise, the TW might have benefited from an additional speaker to raise the volume levels, but this might not be the case for a care home lounge.

Furthermore, it would have been helpful to design a large print information leaflets explaining the research and to hand these out on the day (or before the research took place). Due to the late scheduling of the day (Age UK agreed on 19th June for the research to take place at Ann Owens) not enough time remained to design such information.

7.6 Reflections on the intervention with the TW

Conducting the half-day intervention at the Age UK daycentre in East Finchley was useful to get some feedback on the TW concept and the interaction mechanism. However, the design of the artefact was not aimed at this location, which needed to be considered when interpreting the returns.

The daycentre clients were in comparison overall younger and less vulnerable than the care home residents, but the dimensions of 'vulnerable' are fluid (J Vines et al., 2014). One could see that some daycentre clients were also fragile and vulnerable like the woman, who had early dementia and who pressed the bell.

One positive observation from this round of research was the usefulness of freeing-up both hands. With their hands available (rather than having to cover a sensor) participants were able to express themselves naturally with gestures while talking. The decision for a button was the right direction. Whether the infrared sensor might be more suitable as a mechanism I can't tell. One worry would be that residents could activate the sensor without noticing.

Having applied lessons from previous in-the-wild research (e.g. one dedicated helper, reliable network) and having an established relationship with the daycentre and some clients, made the set-up of the intervention much easier. However, the simplified set-up also caused some confusion for some daycentre clients.

7.7 How does design journey (DJ) 3 address the sub- research questions (1-4)?

The following section addresses the sub-research questions 2-4 (sub-RQ). (sub-q1 was not addressed):

7.7.1DJ3's contribution to sub-RQ2

What are the design considerations when designing online technology for older people?

Considering the vulnerable target audience I had to understand what the residents were able to do and what they were used to. As Ingestre Road residents were already familiar with computer equipment on a trolley I decided to place the TT onto wheels in order to make it a portable and movable TW. I also had to understand the care home environment and care home managements' interests. I treated the care home management and KIT as my clients and collaborators. Management advised to introduce the residents slowly to the technology by using the existing equipment and Skype and to gauge residents' reactions. However, the WI-FI set-up in the care home and existing equipment was not straightforward suitable for this activity. As it is a council run care home and not an outward facing profit-making organisation, the technical team did not allow other devices to connect to the WI-FI network. 3G dongles were used to provide online connectivity, but dongles were not as reliable as a permanent WI-FI connection.

In regards to the volume mechanism I could not decide, which option to go for. Should the resident make a conscious decision of switching the volume on with a button or should the volume automatically go on when a person was in front of it (using an infra-red sensor)? The latter meant that the sound could have been switched on by accident when pushing the TW with the sensor near a wall or by walking past without realising.

I didn't have the chance to compare the TW's interaction mechanisms in the care home setting. It also needed to be considered how the resident would learn about the TW. At the beginning it was expected that a resident together with a volunteer would use the TW. After the residents got used to the concept, the TWs were supposed to be left on in the lounges. If a resident or staff member wanted to communicate through the TW they were able to press the bell. The bell functionality was a suggestion by the care home management and it seemed to be an excellent solution to the problem of how to let the other location know that a person was ready for verbal interaction.

However, when having the TW evaluated at Age UK a woman, who appeared to have early dementia, enjoyed pressing the bell repeatedly. Since this could be the same issue in a care home the bell might need to be re-considered or replaced with an “attention light” rather than sound.

7.7.2DJ3’s contribution to sub-RQ3

How may new online social interaction technologies be made suitable for adoption by older people?

Conducting research with elderly people is different to conducting research with active older people. In order to design technology for elderly people the researcher can speak with the target audience, but staff, carers (informal, formal) and trusted people around them are as important since they are “gate keepers” to influences for the elderly person. Rightly they are protective over the vulnerable person’s interests, health and strength. The design researcher needs to build up relationships and gain trust from all parties (and people) involved. This process takes time and cannot be rushed. It makes sense to introduce new technology slowly and collaboratively with the people surrounding the target audience. This is easier when elderly people live in a care home, since people around them are organised through roles and responsibilities. It appears that it may be more feasible to conduct design research in care homes, in comparison to design research with elderly people living at home. The main reason for this is that accessing elderly people living at home is not as easy as accessing them by visiting the care home.

Another question would be what do vulnerable elderly people, who live in a care home, need new social interaction technology for? Is it to make new friends or to provide companionship? If this is the case, technology alone cannot provide this. However, the TW intended to provide awareness of people in the other lounge and a novel way (and very simple way) to contact them. Whether this concept would have been fully accepted by the residents is not clear. The intentions though were to offer the technology for ludic engagement rather than serving a health goal directed purpose. However, it cannot be excluded, that staff might have (mis)used the TW connectivity to communicate important messages or to keep an eye on a particular person.

Conducting the intervention at Age UK brought home to me how helpful it was that I had an established relationship with Age UK. Some of their daycentre visitors remembered me by now and were therefore more trusting and interested in my research.

7.7.3DJ3's answer to sub-RQ4

Which elements of a method make it suitable for researching new technology with or for older people?

As found in the first design journey the empathetic approach and contextual design work well with older people or as in this case with vulnerable elderly people. With this approach the researcher has to form relationships and get to know individuals. If the relationship is not directly with the elderly person, then it needs to be with the people who are closely involved with them. If a relationship is developed with the elderly person, then attention needs to be paid to the question what will happen when the research comes to an end.

In many ways researchers researching elderly people have to find a balance between closeness and understanding their world, and the boundaries of withdrawing from their lives without leaving strong emotional marks. This balance needs to be found from the perspective of the researchers (for the protection of their emotional life) as well as with the people who contribute to the research. In conversations with other (design) researchers (Peter Ziegler, Dr Shailey Minocha) interested in older people I found that we compared our work to roles such as the "technological therapist", "technology nurse" or simply "helper". The fellow researchers also reported finding themselves in a position of helping the person they were interviewing with other little things, which were not exactly part of the research.

When Skype was tried out at the care home it was about involving the residents at the right level, where the interaction is fun and did not become too exhausting for them. This was only possible because I built on the trust & knowledge that KIT volunteers had developed with the residents. Introducing Skype collaboratively with the KIT volunteers meant that there were more people to reflect on the experiences and to help with informing a judgement on how well the video connectivity was received by the residents.

With this design journey I also conducted an evaluative intervention. It was my fourth in-the-wild intervention but the first one with the TW. I was aware that Age UK was not the ideal place for a 'natural settings' intervention, but it was more relevant with their mixture of active older and vulnerable older people, than no intervention at all. Due to my previous experience of technical difficulties and issues of finding people to help I kept this intervention short and very informal. I had one research helper who was also the conversation partner through the TW. With no cameras, no consent form, no questionnaires, it was noticeable that participants were more willing to take part.

Overall, an informal research approach seems to work well when interacting with older people and enticing them to try something out.

Chapter 8

8 Design journey 4: Co-design

This chapter describes the planning and execution of the co-design activity involving specifically selected participants. Conducting a pilot workshop was crucial for fine-tuning the format and structure of the day. The chapter continues with a summary of the workshop discussions, before reflecting on the research activity and providing an answer to the sub-research questions.

8.1 My starting point

My theoretical framework for the co-design activity was merging the showroom as place of research with a *make* workshop for reflective co-creation see Chapter 4.4.3. It was a showroom since I provided a narrative about the emergence of the TT and TW and the physical artefacts for participants to take in and reflect on. It was a *make* workshop, so that stakeholders deeply and actively engaged with design questions and choices.

The participants learned and gained inspirations from my previous journeys and from the physical artefacts that were on display. The showroom narrative cannot be taken for scientific research, but as a “persuasive argument” (R. Buchanan, 1989) for why it was useful to build on the audio-visual concept as demonstrated with the TT and TW.

I intentionally involved Lisa Dubow (Age UK) and Jeremy Morris (KIT) in telling the narrative to portray a multi-dimensional and honest picture of the experiences – or as my supervisor would say “with warts and all”. I designed specific exercises in order to guide participants through the *make* workshop, but at the same time I was conscious of not steering their discussions with my involvement.

In the description of my methodological approach (see Chapter 4.4.6) I discussed the influences in composing the toolkit. The following present my activities in fine-tuning the toolkit.

8.2 Conducting a pilot workshop

On 19th June 2013 I conducted a pilot workshop in order to validate the structure and exercises of for the extended showroom. A description of the main outcomes can be found in appendix 6.1.

8.3 *Extended showroom* workshop structure

The co-design workshop was designed to entail 3 major phases:

- The showroom: Provide an inspirational narrative around the TT and TW and the physical display of the artefacts
- Divergent phase: Facilitate participants' divergent thinking with fantasy and group brain storming
- Convergent phase: Support participant's convergent thinking with prioritisation of ideas and the keep / change / lose technique

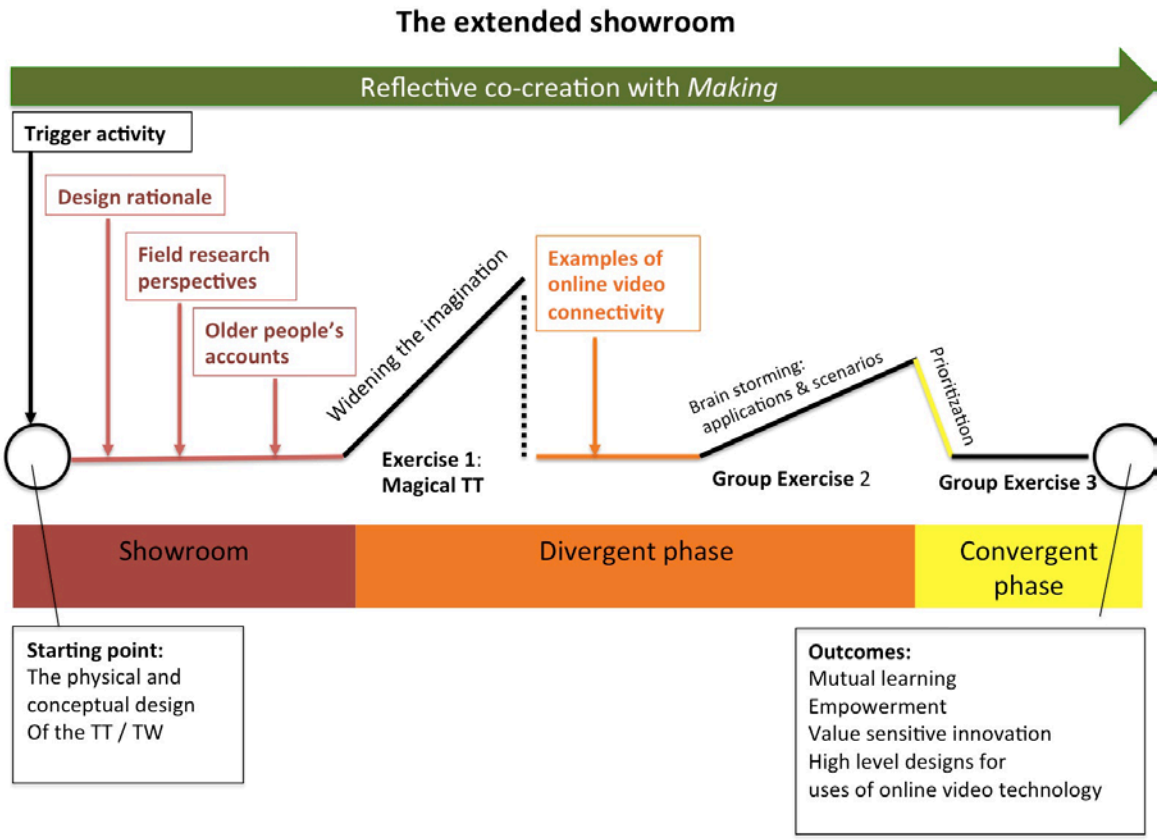


Figure 60: Diagram for the extended showroom as developed for this research

The day started with introductions, in which the trigger exercise for the make workshop was placed. Participants were asked to tell a memory of their first TV. I chose intentionally the connection to the TV for several reasons. Firstly, everybody was likely to be familiar with TV watching, Secondly, the TT's form and shape was based

on early TV design and lastly, because I wanted to evoke in people a memory of a technology, which frequently brought people together in living rooms. Placing the trigger activity at the beginning of the design workshop, meant that the unconscious was given time (during the showroom phase) to work over associations accessing latent and tacit knowledge.

Then the showroom activity took place. A narrative of the design journey was told, where Lisa Dubow (Age UK) and Jeremy Morris (KIT) contributed with highlights from the interventions. The TT and TW were set-up in the room to be tried out.

Dr Shailey Minocha was invited to provide a perspective from her research involving older people's social interactions, and the role online live video played. The idea was to provide further perspectives on the role of online video connectivity for older people. Aim of the showroom was to provide participants with a persuasive argument for why it would be useful to employ online video technology with people who were not media literate and who had varied abilities due to age. At the same time it was important to me to provide with this narrative an honest account about people's reactions to the TT and TW during the interventions, which meant including the reactions of dis-interest or concern.

In the second phase, the divergent thinking phase, stakeholders were asked to let their imagination free with the magical exercise. After this I provided examples of existing use of online video in useful (e.g. inTouch (Boyd, 2014), Speaking ATM (Adach, 2012)) and playful applications (e.g. Telectroscope (Pike, 2012), Video window (Blythe et al., 2010)) for inspirations before the second exercise took place. In the second exercise participants were asked to form groups in the specific composition and to brainstorm scenarios for use.

In the final phase, the convergent phase, ideas were prioritised and groups were formed by interest in the topic. In the last group exercise stakeholders were directed to develop a conceptual outcome by applying the keep / change / lose technique.

8.4 Workshop's schedule and exercises

The schedule of the day, including the exercises, was as follows:

10:00	Arrival
10:15	Welcome & Introductions *Your first memory of your TV*
10:30	John Miles: Introducing the BSG
10:45	Marianne: Why was the Teletalker designed?
11:30	Dr Shailey Minocha: Older people's accounts of their online social interactions
11:50	Coffee break
12:05	**Group exercise 1:** "Imagine you had a magic Teletalker / Telewalker: Where would it be? What would it be like? When would you use it? And with who?"
12:20	Marianne: Examples of other projects involving online video connectivity
12:40	**Group exercise 2:** "Imagine you're a number of years older, how do you think the concept of the Teletalker / walker would be useful for you?" *Note: In each group is one designer, one older person, one researcher, one person from an organisation*
13:00	Lunch
13:30	Group exercise feedback
14:30	Prioritisation activity
14:45	**Group exercise 3:** "How would you re-design the Teletalker / walker? Make the Teletalker / walker applicable to your chosen scenario e.g. Teletalker visits to your GP By employing the keep / change / lose method."
15:15	Coffee break
15:30	Group exercise feedback
15:45	Wrap-up & questions
16:00	End

Figure 61: Co-design workshop's schedule

8.5 Invited participants

The invited participants were told that they were going to take part in a design workshop in order to shape “the future of the TT”. The TT concept and building on the TW concept, were used as the starting points for reflection and as a vehicle for participants’ imagination for the future.

I decided to work a mixture of roles for the participants in the groups since it appeared that creative thinking is more conducive in mixed groups (Sustar, Jones, & Dearden, 2013). The groups consisted of one designer (maker), one academic researching older people, (academic) one praxis-oriented i.e. volunteer of member of staff working with older people (organisation) and one older person. This group combination was important for the second group exercise. In the third group exercise participants were joining the group of their interest, rather than based on their allocated role.

All participants were invited on a voluntary basis, investing their own time and interests. The only exception was two older participants, who I asked to be recruited by a professional recruiter in case we had no-shows or last minute cancellations.

The British Society of Gerontology (BSG) provided with a small funds grant the catering for the day. I recruited the participants through contacts I had established through my research and through KIT, Age UK, BSG, Barnet’s older people forum. Although, ideally I would like to have invited older participants, who had previously taken part in my research, but in praxis it became unfeasible for a previous participant to be involved in a day’s activity from 10-4pm. In this respect I had to carefully consider the configuration of participation and make trade-offs between what was ideal and what was possible (Steen, 2012).

The two older people who were recruited fulfilled the criteria of one person over 65 years, Internet savvy, and another person over 75 years, who was not media literate.

It was anticipated and intended that the designers – the makers - in the group hold the pen in order to externalise ideas and thoughts. None of the designers had previous knowledge of the TT research and therefore had no pre-conceived ideas on how it could be developed. In preparation to the workshop I asked participants to write a 100-word biography. This information collated and was circulated during the day.

The list of participants, who attended the co-design workshop on 11th July 2013, can be found in the design workshop summary report in appendix 6.2.

Two participants had to leave earlier, and one person had dialled in via Skype (Jeremy Morris), which meant that 13 people remained for the group exercises 2 and 3.

8.6 Workshop's discussions and outcomes

The extended showroom was video recorded when people were talking addressing the whole room, but group discussion during group exercises were not recorded to encourage debate where people did not have to worry about what they say.

A workshop report has been written to provide a summary of the discussions on the day, which is included in appendix 6.2. For now, a short summary of responses to the group activities are listed:

8.6.1 Trigger activity

Most participants were recounting memories of the shape of the TV, first programs they saw (e.g. the queen's coronation) and family rituals around those. A younger participant had memories of the power struggle around the remote control, while another participant remember the smell of the TV when it was warming up.

8.6.2 Magical exercise

Participants, in pairs of two, were asked to imagine that they had a magical Teletalker, how they would use it and what it would be like. This exercise served the purpose of activating fantasy or dream-like imagination. Ideas varied from exotic, practical and fun. For example one group of participants explained how they wanted *"a Dr Who like talking stick"*, where they could connect with important people from the past, preferably in 3D projection. He further described: *"But this stick needs to have a clear off button to avoid being drawn into fascistic coercion.*" Two more groups mentioned in this exercise the off button or a curtain for the screen for privacy.

8.6.3 Critique phase

For the exercise: "Imagine you're a number of years older, how do you think the concept of the Teletalker would be useful for you?" participants were asked to sit in composed groups. This composition aimed to communicate that the participants in their roles are experts in their domains. Participants were asked to brainstorm ideas. All 3 groups covered a wide range of topics, usually with the designer holding the pen to externalize the ideas.

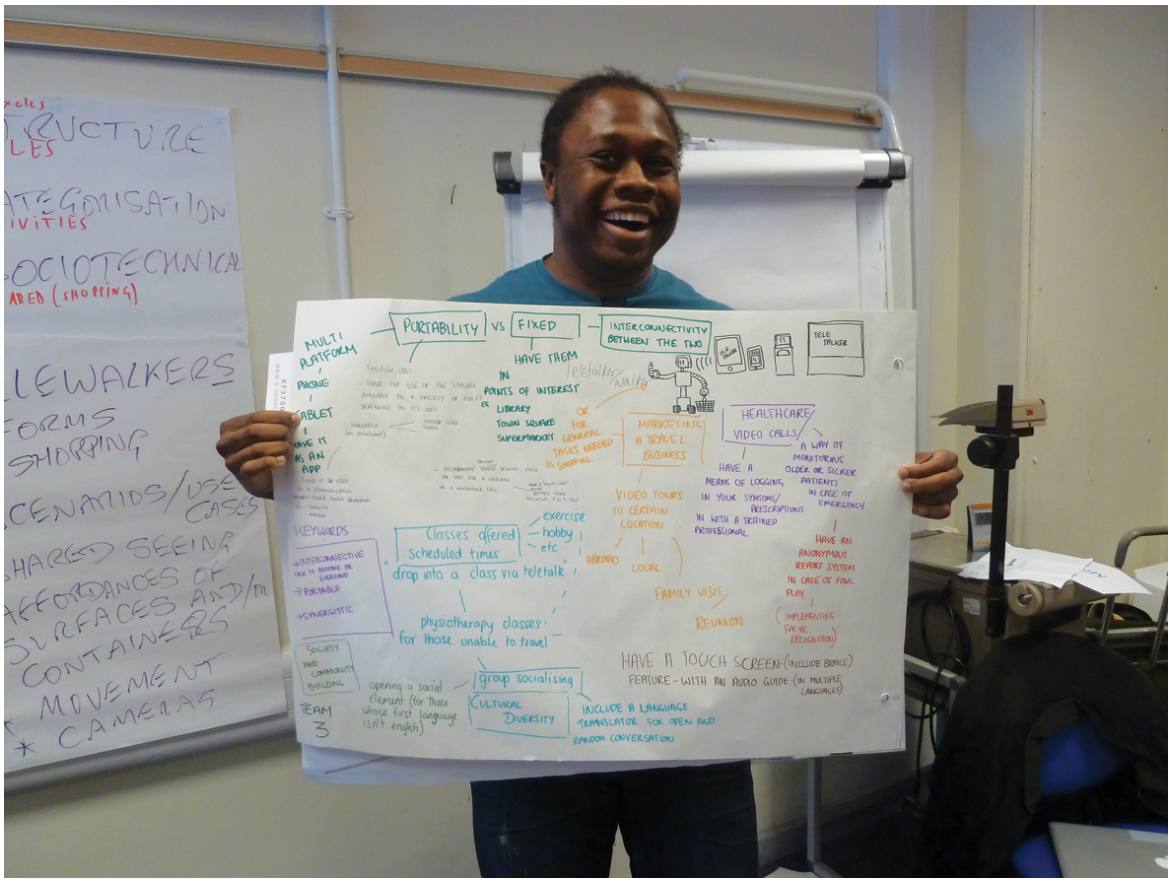


Figure 62: A designer participant holds the flip chart with brain stormed ideas

When the groups presented their ideas to the whole group a number of questions and discussions occurred. There was one discussion around how to group older people, which concluded that older people should be grouped by ability rather than age. Another point raised by an older person was that not all older people are living in care homes. Further concerns discussed were the fear that machines might replace human contact and the need for global guidelines when introducing technology and new roles for people.

8.6.4 Convergent phase

After the prioritisation exercise, three self-selected groups were formed by interest. The chosen scenarios were:

- Virtual hospital visits
- Socio-technical issues – e.g. shared shopping
- Connected learning

The keep / change / lose technique was employed to reflect on the design of the TT or TW as a starting point. By doing this, the 3 groups developed a high-level design for their chosen scenario.

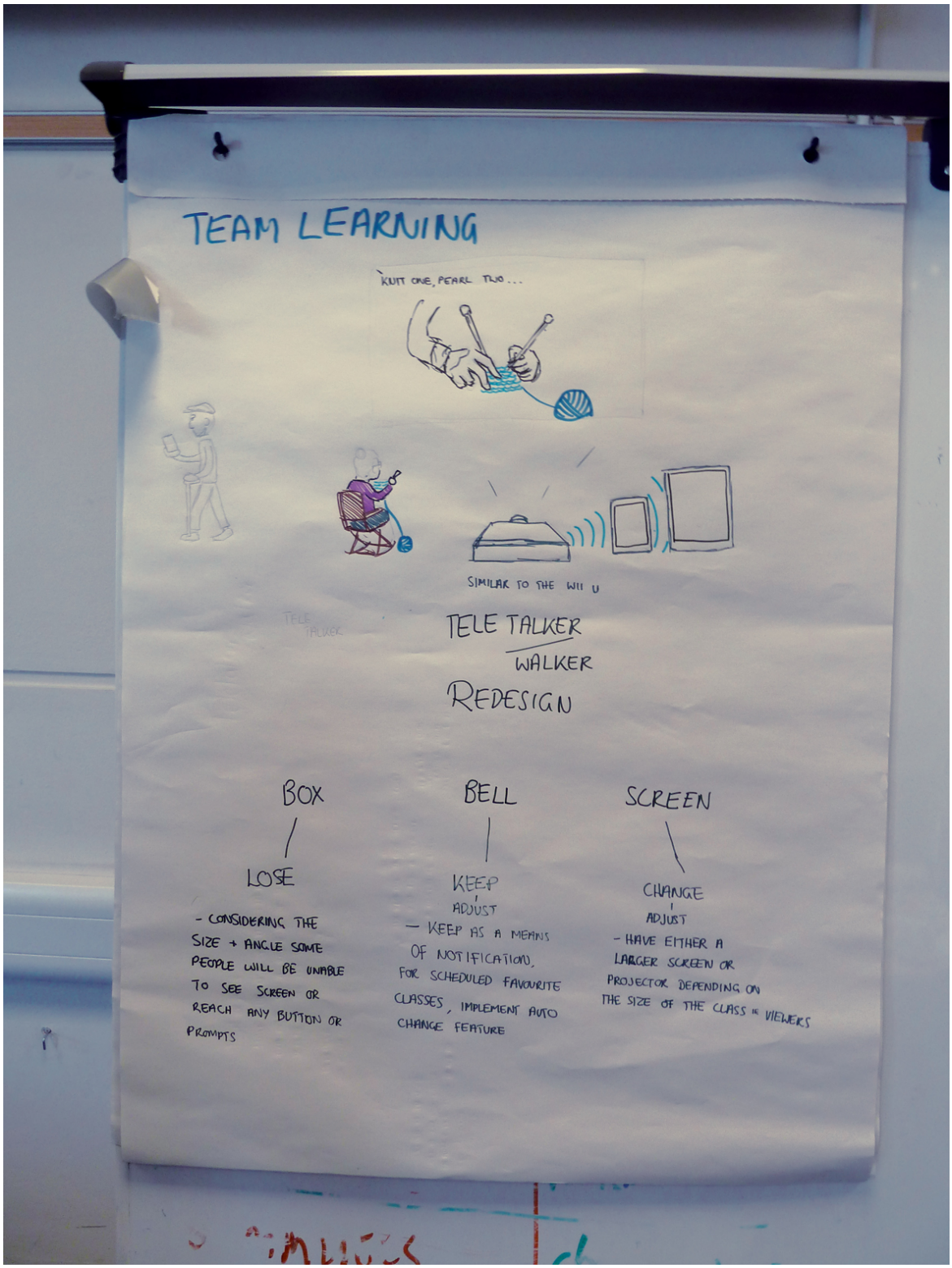


Figure 63: High-level design output by the 'connected learning' group

In all 3 high-level designs the re-designed TT still connected places but the screen would not always be on, which was in contrast to the current TT / TW design.

The participants' designs made clear that the physical form of the technology depended on the specific context. For example, the screen size might vary depending on the group size. In the hospital context, the developed design had wheels, but this was

not seen as necessary in the learning context where any other screen such as the TV, ipad or mobile phone could be used.

8.7 Workshop feedback by participants

At the end of the workshop participants were asked to provide verbal feedback on the day as well as to fill out a simple form.

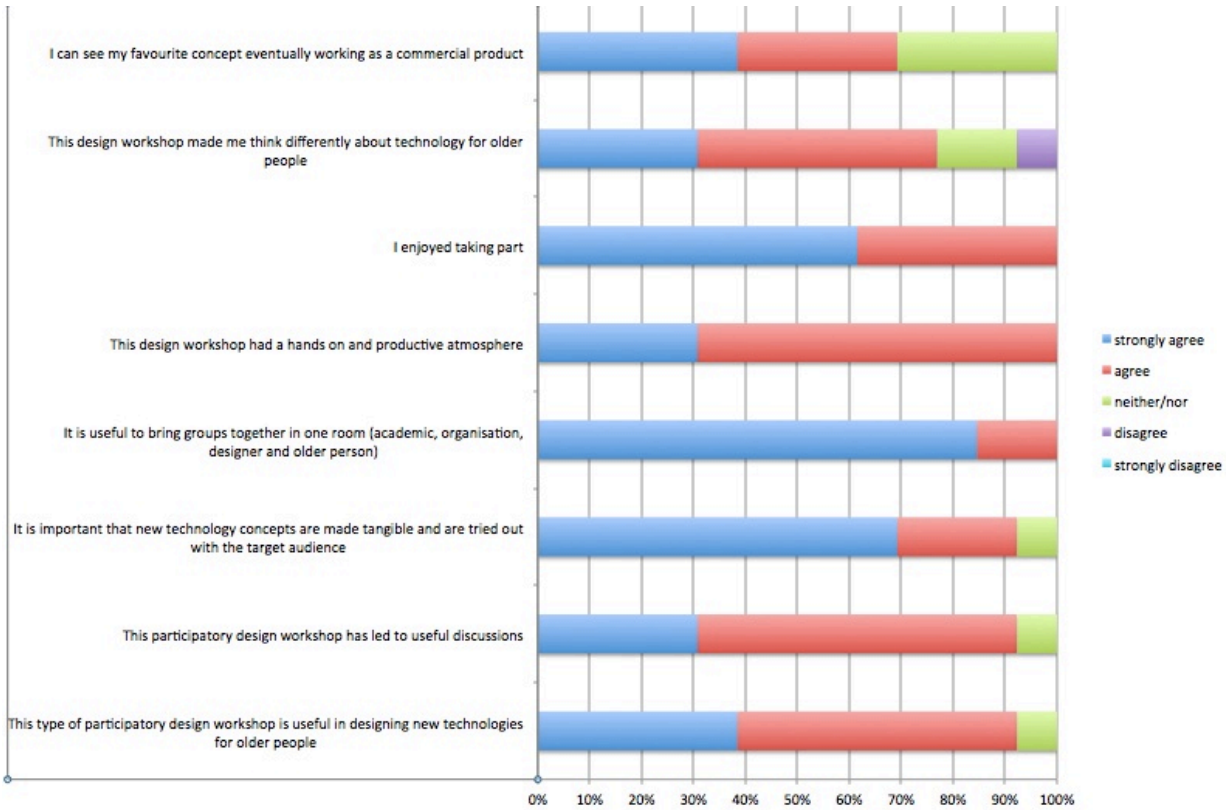


Figure 64: Response table showing feedback from the workshop

From this response table, one can see that the vast majority of participants strongly agreed with the answer that was useful to bring groups together in one room. The next answers that received a large number of strongly agree votes was the importance of making new technology concepts tangible and to be tried out by the target audience followed by the answer that participants enjoyed taking part. One experienced academic participant stated that the workshop did not make him think differently about technology for older people, but this was not surprising since he was experienced in research with older people.

Several participants, in particular two older participants, asked keenly about follow-up workshops to continue discussions.

Two months after the workshop I circulated the summary report and invited feedback on the report as well as on the workshop. I had positive reactions to the format of the summary report. One older participant explained to me that she now fully understood what she was doing during the workshop because the report listed the TT design principles (see workshop report in the appendix 6.2). During the workshop the principles had been communicated, but not in the same succinct way.

Six months on I invited participants once more to reflect on the workshop experience, in particular on the group dynamic experienced considering the composition of the groups.

I had a limited number of responses. These were positive, pointing out that there were limits to what could be achieved in a day, whilst inquiring whether there would be a follow-up activity. Two responses were particularly noteworthy.

One older participant explained (verbally) how it felt initially intimidating to go to a university building to speak with academics and other experts, but she grew comfortable once she got to know the people more. Another participant emailed how working with technology and design “in electro-magnetic fields” was only half the story for making human contact satisfactory. He pointed out how the other half was the “psychic and emotional question of communication”, which could not be addressed with technology alone. From the participant’s feedback I took on board the frustration, which I share, that technology alone cannot be the answer to connect to older people, and that there is a need for maintaining and encouraging the human qualities of communication between people.

8.8 Reflections on the fourth design journey

Since I prepared and configured only one type of workshop I cannot compare how effective the toolkit was in comparison to other projects. However, if I were to run another “future of the TT workshop” I would adjust several aspects: Firstly, I would choose a different location. The university was perceived as an intimidating location by one of my older participants since she had to interact with people who had doctor titles and who she perceived as intimidatingly knowledgeable. If I could, I had chosen a more central location, preferably with parking, such as a community centre, a room in a museum or a gallery to imply creativity.

Secondly, I would plan for more workshops, at least two. Although asking for more time from participants could be tricky (or near impossible, when they have to travel far and are not re-imbursed), it would give people more time to learn from each other

and to develop ideas further with more tangible and creative outputs (e.g. a video describing their idea).

Thirdly, I would improve the feedback mechanisms during and after the workshop. The form at the end of this workshop was too general. If I were to run this workshop again, I would assess during the workshop whether my suggested design principles were heard and how people reacted to them. Furthermore, I would use more free text form for people to write about their experiences and suggestions for the workshop. I intentionally did not get involved in the group discussion because I did not want to steer participants in a direction. However, in the future I would ask them where the greatest differences lay in their group discussions to bring out the tensions and variations in perspectives. After the workshop I would ask each participant to reflect (privately and in writing) on her or his role in the group, whether they had felt heard and the composition worked for them. I would ask them to revisit this reflection in a couple of month time, to see whether a different view had emerged.

8.8.1 Reflecting on the high-level design

The high-level designs are another interesting springboard for reflection. Even though the process of getting all stakeholders talking in one room was most important, the outcomes still play a telling role. The outcomes helped to see where the TT concept had been re-iterated or rejected and how given examples were re-interpreted. The high-level designs can demonstrate how participants might have taken inspirations from the workshop for their own ideas. Participants chose not to develop further the TT concept as presence software with a bell, but they concentrated on online live video connectivity over a shorter period for specific purposes or groups.

The high-level design for virtual hospital visits could be compared to designs for video calling facilities addressing vulnerable groups, specifically to the InTouch project (Boyd, 2014), which was presented with the real world examples.

The high-level design for connected learning, a purposeful application, fits the trends in distance learning developments. As it happened I attended a similar workshop employing the keep / change / lose technique organised by the University of Surrey and South East Health Technologies Alliance (SEHTA) a week later (SEHTA, 2013). In this workshop participants reflected on designing an online learning interface using an ipad for the local U3A group.

The high-level design for shared shopping was the most unusual of the suggested future interfaces. It was based on looking at daily activities an older person might not be able to do anymore (due to bad health or being housebound). In their design a

person, equipped with camera and audio connection, becomes the “walking eyes” in a supermarket, while a base camp of older people pass on directions to the person. I found this concept intriguing because it could be compared to the group use of a MRP robot (I provided the example of the Vgo robot (Thompson, 2013)), but replacing the robot with a human, so she / he can take direction from a group of older people and react to their preferences instantly.

8.9 How does design journey (DJ) 4 address the sub-research questions (1-4)?

The following section addresses the sub-research questions 2-4 (sub-RQ). (sub-q1 was not addressed):

8.9.1DJ4's contribution to sub-RQ2

What are the design considerations when designing online technology for older people?

This question was addressed on several levels with this design journey. Firstly, I had to follow design considerations for composing the co-design activity, which was to enable older people to design together with stakeholders (in the widest sense) future online technologies. Secondly, there was an influence on design considerations that participants embodied with their personal experience and in their role, and which had to be negotiated in-group discussions. Thirdly, there were design considerations communicated through the showroom narrative.

To start with the third point, the TT showroom reported the design considerations from the previous research journeys:

- To avoid the stigmatisation trap by staying age neutral in concept and communication
- To concentrate on one positive aspect of online connectivity, which did not demand computer literacy (i.e. video connectivity)
- To be instantly rewarding
- To consider an intuitive interface (TV analogy) with interaction mechanism suitable for older people's capabilities and for possible use in groups.

In short, the participants were given the TT concept's key features of connecting two places audio-visually, including a simple a volume mechanism and a bell and addressing all generations (i.e. age neutral), as a starting point.

Participants brought their experiences, expertise and interests to the table. For example, one participant who was an experienced designer started with questioning the older person in his group about the obstacles she experienced in her life in order to find a suitable scenario for future designs. Another participant, who was a wheelchair user, promoted not only accessible technology but also the development of guidelines for

the use of the technology, in order to avoid exploitation by people who have different (capitalist) interests. This process of exchange gave people the ability to learn from each other, raise awareness about interests and create common ground. Overall, all participants took part because of their interest in older people, technology and because they wanted to help.

When I configured this co-design activity it was important to me that participants benefitted from taking part. I wanted participants to feel involved in my research and empower them by asking them to design the future of the TT. At the event they were able to learn from each other and could network if interested.

As described in Chapter 8.5 it was challenging to find participants, in particular older participants, who were available for a whole day. I designed the toolkit including the exercises with the assumed group composition in mind. The showroom gave them the TT/ TW narrative and prototypes to critique and reflect. I saw the TT research as the springboard or starting point for group creativity. When participants explored and worked with ideas, they did this without my involvement (participant-led, not designer-led).

Further, I had to consider the practical details for workshop: the location, transport and parking, subsidiaries and the length of the event, materials and research helpers. Although I had experience in organising workshops from my work life in industry, this situation felt very different. The main reason for this I think was the fact that I had to newly create a community who could reflect on my proposition since my research was independent from formal clients and organisations. My research was not driven to achieve a better design proposition, paid for by a client with vested interest. Of course, the event served my interests such as having the TT critiqued by the community and the workshop can be understood as my political statement of wishing to democratise the making of new technologies.

8.9.2DJ4's answer to sub-RQ3

How may new online social interaction technologies be made suitable for adoption by older people?

This design journey provided one answer to this question with the development of 3 high-level designs in the co-design workshop. The 3 high-level designs can be seen as starting points for potential future technology developments (or innovations) since they derived out of stakeholders' consensus interested in this topic.

However, there is tension in the relationship between involving non-designers and producing innovation. Radical innovation (where new solutions are created with new meaning) is more likely to be achieved by designer visionaries, engineers and driven marketeers (D. A. Norman & Verganti, 2012). Working with non-designers individually or in groups is more likely to result in incremental innovation (D. A. Norman & Verganti, 2012), where the current product, service or system may be improved.

In the co-design workshop participants rated 2 out of the 3 design suggestions as likely to become a product. The 'virtual hospital visits' and 'connected learning' were seen as realisable in the real world. These are two areas where a lot of research with online video connectivity already takes place. With the shared shopping concept concerns were raised for the person playing the shopper for a group of people.

8.9.3DJ4's answer to sub-RQ4

Which elements of a method make it suitable for researching new technology with or for older people?

I would like to point out the use of the word method here, because my interpretation is based on Cockton's thinking (Cockton, 2011), which considers a method as an approach applied. In design research the researcher frequently does not know how things will turn out until she / he has done it. In this respect, methods, as I understand it, are tried out suggestions by other researchers of how one can approach the design quest. (At the time I formulated this question I was not aware of this distinction. Also, depending on the field it is fine to use the term method. In HCI for example there are requirements collection methods, which implies a catalogue of tested ways to elicit information.)

For the fourth design journey my approach was constructive co-design research and I applied the extended showroom method. Will I be able to repeat an extended showroom? Not exactly the same one, but the general principles, derived from it, can be applied to other co-design workshops.

The extended showroom is the place where the researcher's construction and story inspires people to imagine and reflect together ideas for future online technologies and to express *(make)* them. The design principles I suggest for the extended showroom are, to offer:

- a multi-perspective narrative around the construction and the artefact (if possible)

- a trigger activity
- a divergent thinking phase
- a convergent thinking phase

In my view this approach and the specific group composition worked overall well. The majority participants took part out interest in the topic, without any financial re-imbursement, and indicated that they enjoyed and learned from the event. 16 people from different places and organisations met together in North London, discussed and *made* future technology designs for a day. This showed that this topic was close to the heart of many people. With the event I tried to offer a suitable environment where participants were looked after and had fun whilst being involved.

However, questions around the effectiveness of the toolkit, the dynamics in the group exercises, the sense of affecting real change remain open since I conducted only one workshop. In regards to the configuration of the participants I had to create my own community and was working with a *relevant diversity* of older people (Lindsay et al., 2012) and stakeholders. In reality it is impossible to achieve a fair representation of such a diverse group as older people are, particularly with a one-day Face-to-Face event, where someone could always fall ill on the day. As feedback from participants indicated, all found the day useful and I'm aware that some participants have been networking and collaborating since.

Chapter 9

9 Reflections on the design journeys

The following chapter details the reflections on the multi-journey journey. It begins with providing an overview of the main differences between the 4 journeys and detailing the major shifts in the design process and thinking. The design journeys are placed into context with other research to mark out similarities and differences with other research or projects. Lee's model of design participation is used to discuss whether the nature of the design process was designing for (collaboration) versus designing with (emancipatory). Furthermore, the role of the design researcher during the interventions is discussed by employing Johnson et al. dimensions on my in-the-wild interventions. This brings out guidelines and considerations for (design) researchers engaging older people. Next the role of the institutional context and my personal life during the various research journeys is discussed. The chapter concludes with reflections on the overall design process by reviewing the CDR model offered by Bang et al. and by answering the research questions considering each design journey.

9.1 Reflecting on the 4 journeys

The overall research question of how may online social interaction technologies be designed for and with older people has been addressed by all of my 4 design journeys. Each journey alone is one possible answer to this question.

In order to draw out the differences between the journeys and the shifts in my design space I have created a table to provide an overview. This table format heavily summarizes the 4 design journeys, and aims provide an overview.

Design journey	Website 2008-2010	TT 2011-2013	TW 2012-2013	Co-design 2013
Type of construction	Wireframes & visual mock-ups for a website	Constructed prototype as 'general' research tool	Constructed prototype as product proposition for	A toolkit for 1day workshop to co-design future online

Design journey	Website 2008-2010	TT 2011-2013	TW 2012-2013	Co-design 2013
			care home residents	video applications
Design journey's focus	**One outcome** such as a product / system / interface	TT interventions, **learning about people's interactions through the TT**, potential uses for the TT	**Understanding the target audience** to make the right design choices	On organizing **the process** of joint reflection and imagination for future designs
Target audience	Web users over 65 years	Any person of any age; Volume mechanism was chosen with an older person's capabilities in mind	Care home residents, i.e. vulnerable older people	Active older people and people, who are interested in shaping technology for future uses addressing older people
Methodological approach	User-centred systems design	Exemplary design research / CDR; in-the-wild intervention as a merger of field and showroom	CDR (field) Emphatic product design; in-the-wild intervention	CDR (showroom) combined with Co-design Make workshop

Table 4: Table summarising the main aspects of the 4 design journeys

My journeys shifted from designing for older users (designer-led) to designing with older people (empowered older people) and from designing one interface or system, to prototypes for research and ending with a reflective co-creation process. These shifts resulted out of a multiplicity of reasons. Considering the iterative and dialectical nature of the design process, the departure point for each journey was different. (During the PhD research however, I did not consider the PhD research journey as 4

different journeys, but as one long one, where I experienced cycles of learning.) Overall, my research journeys can be placed in the Human centred paradigm (Bowen, 2009; Cockton, 2011; Giacomin, 2012b; Krippendorff, 2006) as seen from within the HCI and design community.

By default, during the first journey, explorations addressed a wide remit because I as a design researcher needed to familiarize myself with the topic and the design space. Hence the label **Orientation phase** for the beginning of my PhD investigations.

The **first** major shift was born out of dissatisfaction with the initial approach, when concentrating on older web users only. I realized that if I continued with a website solution I could have produced a "sastificing" (Simon, 1996, p.27) outcome considering inclusive design principles. But older users might have rejected the design and not accepted the site's proposition. One example of a moderately accepted social networking site aiming at people over 60 years is "Drop by". In November 2012 I spoke with founder Mary B., who had decided to set a website up similar to Facebook in 2010. Despite the website's existence for over 4 years the uptake by new members is moderate because of lack of awareness according to Mary B.

Figure 65: Screenshot of the Drop-by website's welcome page taken on 23.04.14

In my view its low uptake also has something to do with the website's design and proposition. The site expects a certain level of web experience. Older users who are sufficiently web savvy are unlikely to go to a portal designed specifically for older people, when they can use their time and skills on sites that are addressing their interests. It could be of course that they have a specific interest in connecting with or helping older people, then this website will be useful for them.

After the pro-longed period of reflection (the incubation period) I decided to act on my dissatisfaction. The **next shift** was my release from the original concept for a website (Cross, 2007). I re-framed the design space to include older non-computer literate people by moving away from a screen-only interface to a physical construction and by concentrating on live online video only. With this shift I also moved from a user-centred paradigm where the notion of a definable user existed, to the performative paradigm applying exemplary design research with CDR as meta-methodology. Exemplary design research is conducted in cycles and needs to stay reflective of its program.

For my self-set research program (using live online video connectivity to connect people – not users - in public spaces) I created a working prototype of the TT, which I then used in interventions. Since I had an established relationship with Age UK Barnet I was able to evaluate the TT with their daycentre clients. This relationship was key for conducting the in-the-wild interventions. As I discussed in the reflections in Chapter 6.9 the placements of the TT kiosks were important in order to generate interest in the views and trying out the TT.

Only because I conducted publicly accessible in-the-wild interventions, Jeremy Morris, chairman of KIT, was able to learn about my *persuasive argument* (R. Buchanan, 1989) first hand. The interventions convinced him to support my research by initiating the opportunity to adapt the TT for care home residents. This was **another significant shift** in my research since I now addressed elderly residents with my design responding to a 'ludic design brief'. Designing for vulnerable older people at the care home meant that I had to build up trust with the residents, KIT volunteers and care home staff to understand residents' environment and capabilities for design choices.

The **final shift** in my research was the turn to a co-design activity to achieve in-depth involvement with the TT concept. This was born out of the realization that debate or discourse on live online video interaction for older people cannot be achieved simply by reporting on the research or by conducting the interventions in-the-wild. For the collective reflections phase I decided to develop the extended showroom approach

to inspire older people and other stakeholders and empower them to *make* the future of the TT. I, as a design researcher, was able to offer propositions for a preferred state, but it was the group creativity and evaluation, which furthered the social process of design in meaning creation, and offered a place for mutual learning.

9.2 Placing my research into context

As I mentioned earlier the first design journey can be placed in context with other research projects with the intention to create online social networking sites for older people. For example Gibson et al. researched the perceptions of social networking sites with technology savvy older users (L. Gibson et al., 2010). The found an uptake of social networking sites, when there was a clear purpose to do so.

There has been a trend to move away from the computer to integrate online social connectivity in different forms. For example, Cornejo et al. used a traditional photoframe as a means to hide a multi-touch pc and to mimic Facebook functionality (Cornejo, Tentori, & Favela, 2012).

Choosing a different form for the online technology such as the TV (and hiding the computer) was one of the motivations behind building the TT. Further examples, for when online technology has moved away from the shape of the computer to unusual forms of online connectivity for active and / or vulnerable older people, are social yoga matts (Maybach, Sokoler, & Nagargoje, 2011), Memento – a physical-digital scrapbook for memory sharing (West, Quigley, & Kay, 2006) and the ticket-to-talk television (Sokoler & Svensson, 2008). All of these projects engage online connectivity to create awareness of other people, a feeling of connectedness and provide an interface for following up mutual interests.

The experimental research I conducted with the TT can be compared to some of the interventions in the STATIC! research program. In this exemplary design research program Backlund et al. explored the aesthetical display of newly designed 'energy' objects to make people think about energy consumptions. They further conducted interventions with low-tech prototypes such as the kinetic Door and the energy tab to elicit reactions from people in the public (Backlund et al., 2006).

Although I did not develop a large range of aesthetical interpretations of online video connectivity for older people, I worked on at least two different versions, namely the TT and TW. The high-level designs from the workshop can be seen as a continuation of explorations of online video connectivity for older people, but created with stakeholders' consensus. The in-the-wild interventions with the TT I have compared to deploying a technology probe (Hutchinson et al., 2003) into natural

settings. The natural settings interventions were important for the purpose of designing and reviewing social interaction. They were needed to engage, observe and understand people's actual behaviour around it. Many other HCI and interaction design researchers found in-the-wild research invaluable to adjust their assumptions around the designed system, which was usually conceived in a research lab (Benford et al., 2013; R. Johnson, Rogers, Linden, Bianchi-berthouze, & Keynes, 2012; Marshall et al., 2011; Rogers, 2011).

Boer and Donovan use provotypes for innovative participatory research (Boer & Donovan, 2012). One of the main differences between their research and the TT research is that the TT never intended to provoke as it is a strategy of critical design, but offered one proposition to explore technological possibilities and people's behaviour towards it a starting point for collective reflection.

The collaborative development of the TW can be likened to the collaborative iterative design process of the InTouch video telephone for people with dementia (Boyd, 2014). Other research focussing on life enhancing technologies as products for care home residents (opposed to life essential products), are the photo stroller (W. Gaver et al., 2010), the video window (Blythe et al., 2010) and a single switch cd-player (Orpwood et al., 2007). The TW and these projects have in common that they support older people's motivation for ludic activities.

The last design journey can be compared with other research projects where older people were asked to critique and explore options. For example, Frohlich et al.'s sandpits (D. M. Frohlich et al., 2014) and Vines et al.'s workshops for 80 somethings (John Vines et al., 2012) started off with critiquing given concepts. Also, Rice et al.'s forum theatre (Rice, Newell, & Morgan, 2007) and Lindsay et al.'s video prompts (Lindsay et al., 2012) portray a story or narrative to get people to engage and react to the researcher's propositions. To ensure an environment conducive to creativity with older people, it was helpful to mix people in their ages and roles (Sustar et al., 2013). Although I provided the stakeholders with a proposition and program to explore, I considered the extended showroom as a design activity where the participants were in charge of the why and how in the *make* activity (Brandt et al., 2010).

9.2.1 Influences of rapid technological change on the research

In 2010 9.2 million adults had never used the Internet and 31 percent of Internet users connected via a mobile phone (ONS, 2010). However, by 2015 72% of adults in Great Britain access the Internet everyday and only 10% of adults had never used a computer (of which 32% are over 65 years old) (ONS, 2015). With this increase the number of people who access the Internet "on the go" has increased drastically. Nearly, all adults aged 16 to 24 (96%) connect to the Internet with mobile or portable devices, compared with only 29% of those aged 65 years and over (ibid.). Mobile phones or smartphones are the most common devices (66%) to go online, followed by laptops or tablets (45%) and other handheld devices (17%) (ibid.).

Any researcher researching with software and computer technology has this challenge of working in a landscape where rapid technological change can influence people's interaction patterns at home or at work immensely. Since the advent of the Internet, the connection speed, the devices (e.g. tablets) and software (e.g. apps) accessing it has changed considerably.

When my research began in 2008, people were mainly using desktop computers or laptops in specific places, but now (2015) with an increased number of hotspots and free WI-FI connectivity, people access the internet "on the go" from personal devices (e.g. smartphones, tablets). More older people are connected through smartphones and tablets, which are now more affordable and frequently given to them by their relatives as a present (personal communication with Lisa Dubow from Age UK). The tablet interfaces appear to be more intuitive since they are based on finger touch on large icons rather than having to point with a mouse, or the cursor and click.

Also, whilst video connectivity has been around for a while (as described in appendix 4.1.1), during the course of my research more people have started using Skype or other readily available software (e.g. Google hangouts, Oovoo etc) to connect audio-visually (up from 30% of Internet users in 2010 to 37% 2015 (ONS, 2015))

A researcher working in this landscape of technological change needs to be aware of what is going on and be flexible about the technology he / she is working with. The TT, in its sturdy physical form, is not likely to be used as a future product, nor the TW. If I were to conduct my research again starting from now, I would use tablets as a starting point for my constructive design research. I'd choose tablets since they are portable and light, affordable, sufficiently large for a small group to look at, and they

utilise a touch screen interface (which initially does not present a possibly intimidating keyboard).

Does the increased use of touch interfaces and on-the-go connectivity imply my research is out-of-date or not relevant to the current discussions? I would argue that my research is still very relevant for the various research communities as I detail in my contributions in Chapter 1.10 and 10.1. The TT and TW were my vehicles for the investigation and I have since worked on the TTconext software, which can be used with tablets or any other touchscreens. With my prototypes and interventions I was able to collect returns and develop a narrative. I gained a greater understanding of context, patterns of interaction by older people and the processes involved for conducting the research. My reflections on the design journeys shed light on forms of participants' engagement and the constructive design process per se. One specific contribution for example, is the *extended showroom*, which is an approach to co-design with older people that is independent of technological change.

9.3 Reflecting on design participation

All my design journeys took place within a human-centred design paradigm (Bowen, 2009; Cockton, 2011; Giacomin, 2012) but design participation was handled differently in each journey considering the different research methods and their associated research paradigms. Participation is an ambiguous word and has varied interpretations in different fields of research and cultural contexts. I am drawing on Yanki Lee's paper on design Participation tactics (Lee, 2006). Based on Lefebvre's concept of abstract and concrete space Lee developed an analytical tool to understand the relationship between design experts and people related to the development of design processes.

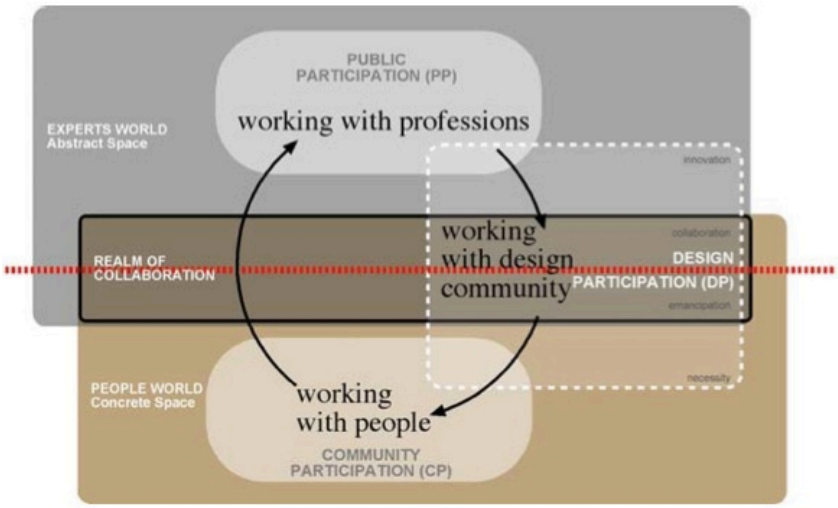


Figure 66: Lee's model of design participation based on Lefebrve's concept of abstract and concrete space

The abstract space is the grey box where the professional designer used to work by envisioning designs separate from the user. The brown box is the concrete space in which people live and experience the world. The overlapping of the space is where collaboration and design participation takes places. Concentrating on the white dotted square Lee distinguishes between 4 types of design participation between designers and non-designers: innovation, collaboration, emancipation and motivation. According to her categories, innovation is designer-led, collaboration is designer-driven, emancipation is user-driven and motivation is user-driven. Projects based on motivation for participation are rare since they imply that non-designers themselves decide to turn into designers. As an example Lee offers Walter Segal's house, which is a self-assemble house to be put together by anyone (Lee, 2007, p.10).

Considering that Lee's paper is from 2006 and design research in the fuzzy front end had increased (with e.g. probes for dialogues) the diagram may be too simplistic. For example, the innovation category may need to be re-considered since designers can use empathy probes for dialogue and therefore have touch points with the concrete space. At the same time the empathy probes could be placed into the collaboration area, but this may depend on how much the designer interacts with the non-designer. Overall, I consider Lee's representation as useful to highlight that the majority of design participation takes place between collaboration and emancipation, between *designing for* (collaborative) and *designing with* (emancipatory). Depending on the design participation techniques employed, a research journey can oscillate between the two spaces, particularly when the design researcher works with an empathetic approach. The dichotomy between for and with is not a clear cut as I will show when I reflect on my design journeys applying this model of designing for (collaborative participation) and designing with (emancipatory or empowering participation).

In the **first journey** older people and users acted as informants during the requirements collection phase. I tried to immerse myself into their world by observing their computer and Internet use. Following a solutions focused strategy I developed wireframes for a concept of a website. Due to my aspirations of involving older users in the development of a design brief for a social media site I conducted two storytelling workshops, where older people participated with empowerment. The first part of this journey can be described as mainly *designing for* in the collaborative space and the storytelling workshops as a *designing with* approach in the emancipation space.

In the **second journey** older and younger people were involved as active participants in the design experiment and interventions. Two members of Age UK Barnet reviewed the TT during the artefact construction experiment. During the 3 interventions people were participants either by actively using the TT, being a bystander or by rejecting it. They evaluated the TT concept & design and made suggestions for future designs and placement opportunities.

This journey could be described as a *designing for* journey, although in the moment when participants made design suggestions they were also inspiring future uses for the TT and feeding into the narrative for the co-design workshop. Nevertheless, I place this journey predominately into the collaborative space and not in the

emancipatory space since people were not explicitly made aware how much they influenced with their feedback future propositions.

In the **third journey** the TT was modified to address the design brief posed by the care home. It was a highly collaborative design journey where stakeholders (Care home management, KIT) and users (residents and KIT volunteers) were involved in the design process to build up trust and develop understanding. The residents were slowly introduced to online video connectivity to gauge the interest in the concept.

The third journey was predominately a *designing for* journey. But due to the close involvement with the KIT volunteers and getting to know the residents whilst carefully introducing video technology it felt more like a *designing with journey than for*. If the residents had rejected (or were not interested at all in) the introduction of video connectivity using Skype, then I would have not pursued the research further. In this respect they were empowered to reject the idea. However, overall I place this journey in the collaborative space, rather than the emancipatory space since **the residents** were not involved in formulating the design brief nor did they articulate that they wished for an online video system for ludic engagement. However, I could also argue that this was a *designing with* journey since the care home management was involved in formulating the design brief in the interests of the residents. The difficulty in placing this journey in either of the spaces demonstrates how the concept of design participation is not clear cut and depends on the design researchers' political position on how she / he considers 'emancipation'.

In the **fourth**, the co-design, journey, specific selected participants developed collectively their views for future applications whilst they reflected on the TT showroom and evaluated the TT design principles. I, as a design researcher, designed this co-design workshop, where I intentionally moved between inspiring and steering the participants to provide space for participants to develop their ideas. With this I aimed to empower (emancipate) the stakeholders, therefore the last journey signifies a *designing with* process. Without my direct involvement the groups developed concepts, but the outcomes could also have been discussions rather than developed idea. Despite the group's collective creativity, I perceive it also as a *designing for* journey, since I designed the format, content and exercises for the workshop. I also selected the participants, which meant that I configured the participation. Nevertheless, I place this design journey in the emancipatory space. If

my research into online social interaction for older people were to be continued I would use their discussions and concepts as a starting point.

9.4 Dimensions of the researcher's role during in-the-wild interventions

Since in-the-wild interventions formed a major part in my research journey I would like to reflect on the role of the researcher in those instances. For this, I apply Johnson et al.'s dimensions on the researcher's role during the research (facilitating or encouraging, explaining, level of authority, familiarity with participants, the researcher's relationship with the research)(Johnson et al., 2012).

> *"Researcher participation in-the-wild offers new perspective on deployments, offering insights which arise from understanding context, building rapport with participants and empathy based on shared experience" (Johnson et al., 2012, p.1144)*

Dimensions by Johnson et al.	**TT**	**TW**
Facilitating or encouraging Spectrum from facilitating use by offering technology in an accessible place to championing the technology	In the TT research it became clear that the researcher or a member of the researching team had to encourage use	Encouraged use was championed
Explaining Explaining of the technology needed? (danger of influencing the participant's opinion) Difference in goal based explanation vs free-flow activities	It became clear that context information to the research was an absolute must. Signage and explanations were useful. People tended to provide "goal based" suggestions e.g. help desk service Free-flow appeared to be useful to have serendipitous returns such as measuring the queues for the coffee bar	Explanation was crucial to introduce residents and daycentre clients to the TW. During the introduction of the TW the goal was to communicate verbally so the mechanism and bell could be demonstrated. Any subsequent research would have been free-flow since the TW was more about providing an awareness of other residents than a 'forced' task

Dimensions by Johnson et al.	TT	TW
Level of authority Researcher has authority over participant as being their equal or inferior (in labs the researcher acts with authority, in-the-wild it could be that the participant has more domain knowledge)	I endeavoured to treat participants as equal when we chatted through the TT, but I exercised authority in using / modifying the TT equipment. Presenting a sense of authority is also important in making the participant feel valued with their time and feedback they are giving. I noticed how I used my level of authority when I asked students to enact the comfortable use of the TT.	Although I had authority over the making of the TW, I felt dependent on the support by the KIT volunteers and on passing on their knowledge about individual residents. When speaking to the residents I felt humble since I had not their life experience. At the daycentre I felt a higher level of authority because clients were asking me about the TW equipment.
Familiarity with participants Knowing or getting to know the participants is helpful in regards to understanding the fuller picture, but it will also influence the researcher's judgment	In the first round of the TT research there was one group of women sitting near the TT and who were positive about trying out the TT. As a 'thank you' I provided them with hot chocolate the next day. Getting to know them was helpful since this way I could rely on them being comfortable to speak to a random student. In my view getting to know them did not influence my judgment in any concerning way. What is important, however, is that I became aware that friendly relationships could have augmented positive feedback.	Getting to know the residents at the care home would be a long process. Although I visited the care homes several times, not on every occasion residents were in the mood or able to interact, nor did I have the time to spend prolonged time in the communal room. Depending on some residents' level of dementia, it might have taken even more time to establish a trusting relationship. In hindsight I am happy about not having established too close of a relationship, otherwise I would feel guilty now for not visiting them anymore. A couple of daycentre clients remembered me from the Christmas TT event and this was beneficial when evaluating the TW since they trusted me and showed interest.

Dimensions by Johnson et al.	TT	TW
The researcher's relationship with the research Levels of feedback depend on the portrayed emotional investment by the researcher into the prototypes	I intentionally distanced myself physically from the TT in order to collect feedback without the person knowing that I had created it. At times when a person asked who made it and I explained that it was myself, I had mostly expressions of admirations and some of disbelief (I guess that most were not expecting a small woman to build something so big). In my work as a professional user experience designer we emphasized in the lab how we were unrelated to the designs under scrutiny, so that participants could talk freely. However, when the researcher needs to encourage use, it was also important to demonstrate some passion around using the TT otherwise it was not attractive to others follow suit.	I made it clear to Jeremy and Moji that the TW was a prototype, which they could influence. It was also important to me that the message was communicated that the TW was not supposed to replace human contact, nor used as a means to survey residents and staff. The TW was supposed to be used in small groups providing views into the other lounges and in that way being an extension to facilitate human contact and feeling of connectedness. At the daycentre it was already communicated through the newsletter that I was the creator of the Telewalker but that I sought feedback to improve it. By keeping the research approach informal on the day I collected feedback through chats and observations. People were more likely to use the TW because they already knew me.

Table 5: Johnson et al.'s dimensions on researchers' involvement

Although these dimensions are beneficial in reflecting on in-the-wild research, I think that a couple of dimensions need to be added or expanded on.

Most in-the-wild research takes place with ubiquitous computing where technology is integrated in mundane activities or natural setting. With research like this a research team from different disciplines, rather than a single researcher, can be expected. In this respect the dimensions need to cater for the **researching team's criteria**. For example, in the third round of TT research, one research helper was already familiar with the TT research, but another one was not. He did not anticipate the level of

involvement required during the intervention (although I tried to bring him up to speed as much as possible beforehand) and felt not at ease during the intervention.

Another dimension to consider is **researching team's way of collecting data and,** from my perspective**, returns** (i.e. units of the researcher or participant's experience from the pool of data**)**. In-the-wild research is frequently video recorded but this may not be feasible at every location. Questionnaires, surveys, exist interviews, people count, count of activities performed, reviewing the content of activities performed and taking photographs are some of possible tools to capture feedback or usage at the time and in subsequent communication. The researcher may demonstrate use and the participant might repeat it by her / himself, possibly more than once, which provides a learning experience for them.

The interactions described above involve more than facilitating or encouraging, or explaining since they provide an experience. The active role of the researcher in the returns collection is likely to reveal more insights on the interplay of behaviours and perceptions than through using or explaining the prototype alone. A particular interesting consideration is to develop returns collection methods that provide the participants with time to reflect on the experience. In this respect the research team has to be available for contact for a prolonged time, which makes the role of the researching team a constant in the research process. This could be exaggeratedly seen as moving towards a partnership, rather than being a one time demonstrator or facilitator.

9.5 Types of knowledge produced through researcher involvement with in-the-wild interventions

With CDR in-the-wild interventions various kinds of knowledge are produced. Since there is no script for conducting CDR in-the-wild interventionist research it is difficult to generalise the process of knowledge production for this approach. Furthermore, CDR is an emerging approach, and its epistemological foundations have still to be fully critiqued (see chapter 3.4.2 and 3.5). I will argue that my particular in-the-wild

research contributed knowledge to several epistemological perspectives (the pragmatic, the constructivist / interpretive and the artistic / performative[48]).

For example, coming from a straightforward systems design perspective my in-the-wild interventions generated actionable knowledge on how to improve the TT system (e.g. adding loudspeakers, a point for a microphone) and how it was actually used by people (i.e. not very much when there was no interaction partner). Being an HCI researcher with a positivist disposition the feedback collected would be seen as explorative, messy, situated and not easily generalisable, but still with value in regards to facilitating design decisions when other research (e.g. usability studies, surveys) support the findings (Rogers, Preece, & Sharp, 2012). Taking a collection of empirical research on this topic (surveys, usability studies, in-the-wild research), the researcher could develop best practice guidelines on live video interfaces aimed at older people for other researchers or product designers.

Considering that I had direct involvement with my participants during the interventions I argue that I was active in the knowledge production in a way that is similar to the work of an empathetic ethnographer. An ethnographer provides principally "a form of reportage" in which cultural understanding is inscribed (Anderson, 1994). To be precise an ethnographer aims to reveal underlying logics of social practice through their interactions during the intervention to discover intent and through reflections. With the ethnographer's reflexivity on the intervention, she / he needs to consider her / his perspective from which the research is viewed (Anderson, 1994; Paul Dourish, 2006a). Ethnography itself may not be the most appropriate approach to choose for creating new technological or consumer artefacts (Paul Dourish, 2006a). Ethnography provides a bigger picture on the context, the logic of interaction patterns and social processes at cultural settings. In this bigger picture, an ethnographer captures how people make sense of technological or consumer artefacts.

Empathy is an important capability of a researcher to understand participants in their context and environment (Kouprie & Visser, 2009), and particularly invaluable for an ethnographer (Anderson, 1994). Empathetic research is not *becoming* the user or simply understanding the users' world, but it's about the design researcher's **response** "to what they [the designer researcher] see as the user's world from their own perspective" (Wright & McCarthy, 2008, p.639). I responded to my participants

[48] The labels for the epistemological perspectives change depending on the methodology literature you read (Denzin & Lincoln, 2011; Hasemann, 2007; Kumar, 2011; Mertens, 2010). There are at least 3 major epistemological orientations: the positivist / postpositivist (where the researcher strives to observe objectively the truth), the constructivist (where knowledge is understood as a construction and agreement by people), the transformative, also pragmatic or performative (where knowledge is actively created by steering changes in the real world).

by engaging with them empathetically. For example, in the first intervention participant **M** reacted with scepticisms towards the TT when it had been moved to the reception at Age UK, where he was sat (see appendix 4.6 – day 4). I explained to him about the TT and in dialog I found out that he was a fan of classical music. I showed him the hand mechanism for the volume on / off with an example of Mozart's "kleine Nachmusik". Introducing the technology with something that interested him, changed his attitude and he was not sceptical any longer, but an interested and active participant on the day.

However, I was not a 'pure' ethnographer in so far that instead of observing people's interactions where I might discover boundary objects (e.g. a time sheet) which play a central role for interactions and social order, I offered the TT prototype as a starting point for interaction and collective sense making. In this respect I was directly active in knowledge production. In a way that is similar to artists creating artefacts or events that embody and externalise their thinking on an issue or topic, I have created the TT prototype as a response to my framing of the design space. There are many debates on how artist or creative practice researchers contribute to knowledge (Biggs & Büchler, 2008; Rust, Mottram, & Till, 2007; Scrivener, 2002). There are strong arguments supporting that artists develop new ways or different ways of knowing by producing their artefact / performance and having people experience it (Barret & Bolt, 2010; Pakes, 2004; Scrivener, 2002). As Dewey writes:

> *"Art is a mode of prediction not found in charts and statistics, and it insinuates possibilities of human relations not to be found in rule and precept, admonition and administration" (Dewey, 1934, p.363)*

I don't claim to be an artist, but I, as a practice based researcher or design researcher, have a similar process of creation (or making) and reflexivity. Furthermore, I used my artefacts to explore sense making and physical interaction by participants around my proposition. As described in Chapter 4.2.5 the TT acted as a probe with which I collected returns that provided me with insights and narratives. My personal involvement in the intervention made me further active in knowledge production, since I empathised and responded to the participants, their intentions and the situation. By reflecting and reporting on it, I have delivered to the research community a perspective that provides context and situated knowledge in a narrative. My own position and analytical thinking shape this perspective. Its strength lies with an honest reporting style bringing out the variety of challenges in conducting this type of research, the role of institutions in this process and some specific older people's character traits.

To summarise I produced different kinds of knowledge through the in-the-wild interventions, which are:

1. ‘A different way of knowing’ by having built the TT and TW and having participants experience it.
2. A reflective narrative of conducting design research conveying situated knowledge of older people and their context in North London, as well as influences of institutions, organisations and myself on the research process.

9.6 Guidelines for researching with active older people

Overall, active older people are like any other adult person, who might be vulnerable in some dimensions (e.g. pregnant woman, a wheelchair user). Following guidelines based on common sense and considering older people’s context will help with conducting empirical research:

- Plan your research activities during daytime (and preferably during daylight).
- If the research is not taking place at their home, ensure to choose an accessible location (for wheelchair users, accessible by public transport, provide parking).
- Offer toilet breaks and ensure toilets are nearby.
- Offer water and other drinks and nibbles of choice (consider dietary requirements e.g. diabetes).
- Allow more time for the research.
- Don't be too structured about the research questions, allow some freedom for diversion and bring them back on track gently.
- Inform the participants as much as possible about the research, so they feel informed and prepared for potential questions asked.
- When speaking about sensitive issues (e.g. loneliness, incontinence) refer to stories you’ve heard about others and let them react or reflect, continue to use their terminology.
- Not being in work, or active in an organisation or charity, can weaken a person’s confidence about their knowledge of the world – re-assure the older person that their opinion is valid and that they really can’t do anything wrong.
- When looking for older people to be involved in research, it appears that older people act as gatekeepers (e.g. being part of a learning group in U3A) and have access to possibly interested participants. When this situation happens, involve

the person who has introduced you to the participant in the research activity (if they are interested and have time) since this shows an appreciation for their help.

- Consider your own appearance and your own age. It may be significantly harder for a young and trendy-dressed researcher to develop a rapport with an older person. The older person may not feel comfortable speaking about their life situation when they have the impression that the researcher has not the maturity to understand them. The researcher him / herself needs to be aware of this and consider strategies to install trust that they can cope with mature topics (loss of friends and family, war time).
- When demonstrating technology, ensure you keep the language jargon free, simple and clear. Emphasize how a person using it cannot break the technology or anything.
- If possible, provide for (small) group experiences, when people know each other already and in public places. Being with familiar people will make the task for the person even more enjoyable and they can reflect on the experience together.
- If possible, offer consistent membership of the research team, so that the participants only deal with one or two people who they previously encountered in order to develop a trusting relationship.

9.7 Considerations for researching with vulnerable older people

To conduct design research with vulnerable older people (towards the end of the vulnerability dimension) the researcher needs to build up a relationship of trust, with the vulnerable older person and with the carer or proxy for this person. Having established the relationship with the vulnerable older person, it begs the question what happens when the researcher leaves (completes their research). For example, an older person can feel abandoned, or the researcher may develop feelings of guilt due to the loss of a relationship that has developed during the research.

The concerns addressed in the previous section regarding consistent membership of the research team are especially important when researching with vulnerable older people and their carers since establishing new relationships take longer, can be more exhausting and possible confusing for the elderly person.

Vulnerable older people are less likely to be forth coming with ideas and suggestions. They are more likely to react to propositions and designs. Reactions and answers might only unfold over time and the carer or proxy can help interpret the reaction.

The (care) system and context around the vulnerable older person needs to be fully understood by the researcher in order to pick the most suitable moments for research, which is effectively a disruption to what the person might be used to. This disruption may or may not be welcomed. The researcher needs to be very flexible to the needs of the vulnerable older person.

The researcher needs more time when conducting research with vulnerable older people. The results of the research are not necessarily measureable in the short term. In many ways the researcher needs to work in the system and include the people who are around the vulnerable older person. The carer or proxy person needs to show willingness to help out. There must be 'something' in the research for them. This 'something' could be the knowledge that the person they care for enjoys the research activity, positive memories of an activity they did together, a bit of free time or a sympathetic ear and the feeling of being appreciated and seen.

9.8 Role of institutions and personal life in the research process

Another layer of reflexivity that I would like to apply concerns the role of the institutions, including "the institution of me", during the research. I introduce this expression "the institution of me" to signify the different normative roles I had to play at this time of my life such as being a caring mother and wife, an enrolled student as well as a design researcher. In the following I will describe and reflect on the institutional influences on the research process, starting with the role of the university, the daycentre and care home organisations and finally my constraints and biases through my roles.

9.8.1 The role of the university

Middlesex University initially enabled me to conduct my PhD investigations with intellectual guidance and conditions to undertake research, but it also constrained the research, in particular with the situation of internal re-organisation, change of processes and funding cuts. In 2008 when I started my research journey I was part of the Lansdown Centre for Electronic Art (LCEA). The LCEA had a reputation to be explorative, constructive and critical. Their research projects usually involved cutting edge technology paired with innovative methodologies capturing artists, designers and researchers' attention and imagination, for example (Parry, Bendon, Boyd Davis,

& Moar, 2008). In September 2009 the LCEA awarded me with an AHRC bursary to conduct my research under their supervision (Dr Stephen Boyd Davis) at the Cat Hill campus. However, Middlesex University had already been in the process of centralising their campuses and a move to Hendon was in planning for 2010.

During my first design journey I was still placed at LCEA at Cat Hill campus, where I had a desk and shared a room with another researcher. At the time the official processes such as applying for ethical approval and incentive money for the participants were effectively structured. I needed to complete the ethics screening form, confirming that I wont put myself or other people's lives at more risks than normally and that I had read the University's code of Practice on research. This form went to my Director of Studies to sign. Since I had a yes to the question "Does your research 'involve human participants' and/or raise issues of a 'socially sensitive nature'?" the screening form had to go to Art & Education Research Office for approval, which they provided.

When I returned to my studies after the maternity break in September 2011 Middlesex University had just been through major organisational changes. The main campus was now in Hendon. The LCEA was not physical space anymore and its leadership had to be re-organised. My original supervisory team was not existent anymore due to staff changes. The new supervision team (Dr. Magnus Moar and Dr. Ralf Nuhn) had to learn about my research and in particular about my new design space i.e. to concentrate on online video connectivity to address all older people, rather than a web solution aiming at users. This change in supervision had its advantages and disadvantages. The new team helped me to re-focus my thoughts and encouraged the change of direction. At the same time I had to re-establish rapport and their expertise in order to have productive meetings. Little did I realise how difficult it would be to apply for internal funding to support my practice based explorations. The organisational re-structuring meant that funding processes (i.e. which pot of money would be used) were not properly established yet, nor which department was fully responsible to support my research with equipment. The Art and Design Institute (ADRI) became my official research home, although I still had no desk or room to sit in, other than the university's cafeteria. Overall, the university's efforts appeared to focus on undergraduate students, rather than postgraduate researchers, due to higher incomes with increased undergraduate student fees.

In order to finance the build of the TT kiosks I had to fill in the research student support fund form. In consultation with technical staff and supervisors I estimated £1800 for the cost of two computers, arduino boards, large buttons as well as MDF material to build the two TT kiosks. But research funds for the departments were cut and my

application was rejected. In collaboration with my supervisors (who also had to learn the new processes) I secured two teaching computers, keyboards and monitors for the TT and I re-submitted the application for £150 for MDF as kiosk material only. Additional small items (such as buttons, receptors and arduino boards) were financed by myself or provided through teaching material by my supervisors. This drastic limitation on the research funds was not clearly communicated when I returned to my studies in 2011. If I had known the hurdles I had to go through in order to secure finance or equipment in order to realise my designer vision, I probably would have re-considered my desire to build something physical and might have concentrated on research by reading and writing only. On the plus side, the period of liaising with members of staff to find out where possibilities for equipment were, allowed for exchange around my research, which was overall useful feedback.

The dates for the first TT intervention were set and for this ethical approval and the risk assessment had to be carried out. Since processes had changed, it was not the Art and Education research office anymore but the Health and Social Sciences (HSS) Ethics Committee. On 5th June 2015 the HSS committee approved the TT intervention, but considered it a concern that students could behave inappropriately in front of the TT, offending and causing upset for older people at the daycentre. To avoid any misbehaviour I had to ensure that the TT was manned at the university's location. This meant that I had to find a person staying near the university's TT kiosk, so I was able to go to the daycentre's location. Since the university had not nurtured the postgraduate community in Art and Design (no room and networking events), it was challenging to find other researchers or students who had time available and interest to help. All these factors (finance, ethical decision, lack of research community) influenced immensely the TT construction and the first intervention set-up. Although, in hindsight the manning of the kiosk at the university's location did not appear to be a negative issue as such, since a person was needed to inform and interact through the TT anyway.

The lack of funding (i.e. not being able to apply any intentional equipment changes to improve the set-up) influenced the subsequent interventions. Especially, since the department wanted to have the teaching computers back, so I had to find replacements and patch up the design of the TT due to different monitor sizes. At the same time I was more prepared for what to expect considering the constraints. For the last intervention I was able to drum up more helpers on the day. When it came to designing the TW I was already more realistic as to what I could possibly ask for in terms of funding, and put forward an application of £100 to cover the cost for the trolleys. I worked with two laptops that were provided by my supervisor, but for a

considerable amount of time I was unsure which type of laptop I would be able to use.

The role of ethical approval for field research as well as health and safety risk assessment is important to ensure no harm is caused to participants or to the researcher. Frequently, this is seen as check point or possibly a hindrance to conducting research, but in my view it is a very useful step in ensuring that everybody knows what the research is about and to view it from different angles. In particular the view of risks that could have financial repercussions is interesting. Signing consent forms before taking video and photographs is necessary, so participants are informed and the researcher is able to use the material to publish their research. But signing consent forms or any form can be challenging for older people and it is likely to deter them from taking part.

Overall, unclear administrative processes at the university and funding limits made the realisation of my practice based research challenging and time was wasted to the disadvantage of the artefact and the intervention set up.

9.8.2 The Age UK daycentres and the care homes

I met the chief officer of the Age UK Barnet daycentre at a conference organised by the charity *Contact-the-elderly*. The chief officer welcomed my research interests and referred me to Lisa Dubow, the development manager from Age UK as my main point of contact. She introduced me to the centre's set-up, culture and routines. I learnt more with each visit and the relationship between Lisa and myself was maintained from 2008 through to 2015 when she left Age UK. The daycentre as an institution influenced my research on several levels.

Firstly, the centre had its own program and routines (e.g. exercise classes, specific events, daily lunch and bingo playing times), which the daycentre visitors followed. My research had to fit around their schedule and program. During the first intervention I realised that only specific time slots were useful for verbal interaction through the TT otherwise the daycentre visitors missed out on their usual activities such as bingo.

Secondly, the daycentre provided me access to a particular type of older person. Regular daycentre visitors frequently had a type of mobility impairment and were brought to the centre through a transport service. These visitors were likely to live on a small pension since Age UK provides services mainly for those who cannot afford them otherwise. With low income usually low education is associated, and this points

towards people who are less open to new ideas. Lisa Dubow did point out that her clients don't like change or anything unusual. The person that complained about the TT research was an example of the type of visitor the daycentre attracted, namely people who are set in their ways and routines. Despite re-assurance about the research, the person felt not informed enough about the change or research and her influence on other daycentre visitors was infections. It would have felt 'forced' if I had continued my research on the day.

Finally, the centre had a Wi-Fi connection in the office rooms and in the computer room for basic email exchange and surfing. During the first TT intervention I was able to use their Wi-Fi connection and it worked overall well. But in the last round when I connected the two daycentres, Age UK's Wi-Fi was not sufficient.

The lack of Wi-Fi was also a major stumbling block when conducting research with the TW. A considerable amount of time and effort were spent on finding out whether I was able to use a Wi-Fi connection, which was offered by Camden Council for the two care homes. It finally emerged that I was not allowed to use the Camden Wi-Fi and I had to find alternative solutions. The mobile dongle solution was the only feasible one, but it was with the network provider 3, which was renowned for patchy network connectivity.

Care homes have their own culture, with their own pace and rhythm. Through the KIT visits I was introduced to privately run and council run care home. In both types of care homes digital connectivity did not have a high priority. When I entered a care home I felt that I left the 'racing' outside world behind and entered an environment where time stood still. The privately run care home did have a more inviting entrance area with flowers on the table, but further along the corridors it had the same run-down feeling as the council owned care homes. I saw staff mainly in lounges where they served biscuits with tea to residents and helping them in and out of their chairs. Staff was ethically diverse and predominately female. In the council owned care homes they appeared to have a bit more time to interact with their residents. Staff was initially cautious when they met me, they were unsure about what I was going to do and they needed to make sure that I would not exhaust their residents. The introduction through KIT (Jeremy) helped, but this meant I was bound to the visit times KIT had for the particular care home.

The general atmosphere was friendly, but quiet. On my visits the TV was nearly always switched on in the lounges with residents sitting in front of it, sometimes awake sometimes dosing. Jeremy explained that the residents were unlikely to make contact or friends with other residents unless they were prompted by staff or

introduced to each other through activities. In this respect KIT's work really helped interaction with residents within a care home. Jeremy is in his 70s himself and had basic computer literacy. He was ok dealing with the KIT computer, but not savvy with technical support. When it came to installing Skype on the KIT computer at the care home, it turned out that no one directly involved in the visits knew the administrator password for new software installation.

Care home management was interested in the research and supported me with access to the care home and their residents, but not with time by their staff. This lack of staff support was something Jeremy acutely felt with his work with KIT. When he had a two hour slot to use the KIT computer in the lounge, and staff did not help him bring residents in the lounge, he would use most of an hour collecting and bringing residents into the lounge. But with time he had established trust and dialogue with most staff members, so they helped him bringing the residents to the lounge when the KIT afternoon started.

Jeremy's example demonstrates that if one wanted to change something (a pattern or routine) in a care home that this was only possible with support from management and with establishing a long-term relationship with the staff on the floors. The natural disposition of a care home would be adverse to change since this might affect the running of the care service or worse unsettle the residents.

9.8.3 Constraints born out of my personal life

Given my conviction to the interpretivist paradigm where I as a researcher play a vital role in the topic of investigation I discuss the influences of my personal life and my self-understanding during the research journeys.

When I started the first design journey I was pre-dominantly a newly enrolled student with industry experience in working in user experience design. Every student (at least those I have met) starts with great enthusiasm and expectations on how one can contribute to the world of knowledge and make a difference. Considering that I had no family at that point and I was used to working on projects that were given to me (i.e. when I worked commercially in industry), I thoroughly enjoyed immersing myself in the topic that I chose and found fascinating.

When I knew that my daughter was on the way I had to adjust my research activities accordingly to ensure any major empirical work was undertaken before the due date and the maternity break. For example, the story telling workshops had to take place

no later than April 2010. As describe in Chapter 5.4 the maternity leave formed an important part in my research journey. Being a mother and away from my studies provided me with a different perspective to the one I had before. This re-thinking resulted in focusing on the design process rather than the outcome.

Returning to my studies in September 2011 implied that I had to juggle the roles of a mother, who had to settle her daughter into childcare, a returning student, who had to understand the new processes since the move of the university to Hendon, and an emerging design researcher, who had to inform her newly formed supervising team about their change in thinking about the design space. Through being a mother where having time without disruption is at premium, I learnt how to focus my energies and to be more organised. All these roles were competing for commitment, headspace and time, where a strong bias (or constraint) was with the well-being of my daughter and family. By the time the first intervention took place, my daughter had settled into child care and I felt like a 'savvy' mother, so I was able to concentrate fully on my empirical research activities. However, I am convinced that events in your personal life influence how you feel and thus how you interpret the observations. For example, I remember how I was reading Huizinga's *Homo Ludens* (Huizinga, 1949) when my daughter Hannah (approaching 2 years) asked me with every item she saw during dinner "is this a toy?". Her question on everyday objects such as a fork resonated with me on what we consider as a toy and playful.

The demand and juggle for time became especially obvious during the second intervention, where I was not able to be present due to other important commitments. Also during the 3rd design journey when I joined the KIT volunteers for care home visits, which entailed a fair bit of commuting, the opportunities to join them were framed by childcare hours. I was not allowed to bring my daughter with me to the care homes due to potential viruses she could have brought with her from the nursery. Overall, I think that experiencing the contrast of very young (my daughter) and very old (see Chapter 7.2.3 - Elisabeth) was useful to balance my emotions around being in contact with elderly frail people who face death in the near vicinity.

Another important influence is the self-understanding of the researcher and their role in the process. As a design researcher you wear many hats depending on whom you are dealing with and what you do. As a designer I gathered inspirations, reflected on them, drew and developed ideas. As a design researcher, I 'designed' the research journeys, observed people's needs, desires, interaction patterns and collected returns & insights. In this role I also was a facilitator, empathic listener, storyteller and persuader, maker and inventor, translator, moderator and critical thinker to name a few. My self-understanding in the role of the design researcher grew with the

time my research journeys unfolded. For example, when I liaised with Lisa Dubow from Age UK I allowed time for her to contribute and to take a possible steer from her since she knew her daycentre clients best. When I met with care home management, who were short of time, my communication was to the point and I had the prototype with me, so they could immediately see what I was working on. My role as a researcher during the interventions was discussed in depth in Chapter 9.4. For the co-design workshop I adopted the role of an educator and facilitator. My critical thinking was most noticeable in my actions after the incubation period where I changed the design space and turned away from my website proposition.

9.9 Reflecting on ideas for different TT location configurations

The TT research journey elicited several ideas to connect people in different places. Not all of them were considering older people exclusively. For instance, in the first intervention participants suggested connecting a library with a cultural club, two daycentres or two care homes with each other. Students suggested connecting Middlesex campus in London with the campus in Kuwait, a shopping mall with a daycentre, a care home in India with one in London or to connect several locations such as Paris, New York and London. After the second intervention a participant suggested connecting a church with a mosque or a birth clinic with a funeral parlor[49].

The question of who and which locations forms a crucial part in interventionist research. I had spent many hours contemplating possible connected locations and would like to discuss some suggestions to highlight potentials and concerns.

9.9.1 Connecting a library and a cultural club

The women from the local Colindale club[50], which offers activities such as Thai Chi classes, suggested this idea. Personally, I think it is an interesting idea although I have some reservations. My greatest concern is around audio in the public library. To avoid noisy disruptions the TT would need to be placed in a separate room, in the book checkout area or only in the entrance area of the library. The same would be true for the club, depending on the activity going on. As soon as the TT stands in a separate room the likeliness that people explore the view is reduced. Although I think

[49] The participant wrote “funeral pastier”, but I interpret that he meant to write parlor since I can’t find anything related to funeral pastier.
[50] Colindale is an area in North London. The club was named after the area and offers various activities on the premises including coffee mornings, talks and exercise classes.

the view around a Thai Chi class would be stimulating, it is likely to be not particularly interesting when the club room is empty.

One option to avoid the audio noise issue would be not to have sound with the TT and simply provide the view. This way people could interact through waving and written messages. But would this be likely if people don't know each other? How would a Thai Chi class member feel when someone in the library was waving at them? Would a promotional video of the local club or the Thai Chi class not offer the same or even a better view (since it's edited and targeted) into the world of the club members or of Thai Chi?

9.9.2 Connecting a care home with a shopping mall

When I played through the idea of connecting a care home with a shopping mall, I could see a benefit for care home residents to have an outside view, but I was concerned about the view from the shopping mall into the care home. I can imagine that care home residents would enjoy watching a place that is busy with people of different ages, taking in changes of season, fashion and types of shops. I doubt that many residents would be active in wanting to talk the shoppers unless it was facilitated. My concern would be, in particular, with care home residents being on display in the shopping mall. Assuming care home residents did not anything to change their appearance when sitting in the lounge near the TT kiosk, their display without context and empathic viewing could be used as a basis to re-enforce stereotypes and messages of elderly people in a care home being frail and vulnerable. Since not much movement happens in a lounge at a care home, the view would be less stimulating than the view into a shopping mall.

However, it would be an interesting scenario to think through, for example, that care home residents could use a room where the TT is located as a "stage for a theatre". This way, those care home residents who are attracted to the idea of theatre and being on view, could dress up whilst coming with a mindset of performing in front of the TT. (I'm thinking here of Valerie the dancer and pianist, see Chapter 7.2.2) Continuing with this idea I worry next about the possibility that a resident might injure him / herself whilst dancing or even fall ill (e.g. heart attack) during the 'performance'. How would this be perceived by shopping mall visitors of any age? From my point of view it is likely that the ethics committee would decide that the TT kiosk at each location is manned to provide verbal context to the display, deter misbehaviour and help in emergency.

9.9.3 Connecting several locations and time zones

The ideas to connect a care home in India with a care home in the UK, the University campuses or 3 major cities have to overcome several challenges. When connecting more than 2 places the greatest challenge to overcome is the complexity in the interface design. To highlight intuitively, which view is in focus and who can speak with who at which location, at the same time or exclusively are challenging design tasks. I had drawn up some ideas for a tuning button (like on an old radio) and selector for the different locations. But soon I realised that adding a third location made the interface very complex, certainly too complex for someone advanced in age and who is unfamiliar live video technology.

A further challenge would be to overcome the different time zones. New Dehli is five and half-hours ahead of London. Finding a suitable time for the TT to be switched on connecting 2 care homes, for example, will be tricky without interrupting a meal routine at one of the places. At the same time this might be another way to think about it, i.e. that the TT connect a place for a limited time (1 hour) during an activity all cultures share (e.g. food). The interest in food is likely to elicit curiosity and interaction. I further make the assumption that the digital infrastructure (Wi-Fi) is provided in both the London and New Dehli care home, but this is not a given.

The idea of connecting two campuses is very attractive to me. Since these are university campuses I do not imagine an issue with Wi-Fi connectivity, but the time difference might still be a challenge. I suspect that students won't use the speak functionality much initially. But I can envisage that once the TT is installed for some time in e.g. a cafeteria, students and staff might be interacting with each other verbally at specific times, such as students shows, design or fashion week.

9.9.4 Connecting a church with a mosque

The idea to connect disparate places of different cultures and believes is very appealing to me, although not without challenges. A live view is likely to demystify ideas about the other place and who goes there. It might encourage participants to look out for similarities rather than differences with fellow believers, but also the opposite could be the case. The live view without the right context could serve as a platform to make judgments about the 'other'. I wonder what the ethics committee might conclude. I suspect that their decision would be for both kiosks to be manned in

order to ensure appropriate behaviour on each side and to provide context information on the different religions (i.e. explaining customs and rituals). Another hurdle for me, as a researcher, would be to establish a relationship with an Imam and to gain access to a mosque since I have no personal connections. I suspect that there would be a level of mistrust as to the benefits of a live video connection with a church. I suspect this level of mistrust can also be expected from the Christian church. Assuming I would be able to establish these relationships, gain trust and access to the buildings, then there is still a question whether the technical infrastructure of those buildings allow for consistent digital connectivity.

Previously in 2012, I had played through the idea of connecting two churches. Churches were of interest since it is a place where people congregate and majority of active churchgoers are older people. I discussed this scenario with an ordained minister of the Methodist church, the husband of an acquaintance of mine. He was initially interested in the idea, but at the time the TT was not ready for demonstration. We discussed how the TT kiosk needed to be in the foyer, or in a separate room, so the possible speaking through the TT would not disturb the service or people's prayers. He mentioned how he could see it working by connecting to the foyer of the sister church. Some of the churchgoers would know each other already, which might help interaction levels. At the same time he raised concerns about the time when people could and should interact. He did not want his members be distracted by view in a different room and therefore not speak with each other before or after the service.

If I were to continue the TT interventionist research strategy I would consider efforts in connecting two places of cultural interests, but embedded in a larger context of artistic and 'connecting' activities. For example if there was a festival of Christian and Islamic exchange I could imagine offering the TT as one option to learn more about the other. With an 'official' program around interventions and activities (e.g. funded by the arts council), an open mindset is nurtured and the expectations around the TT intervention are set differently.

9.10 Reflecting on the overall research process

Arriving at the answers to my research questions was not a linear process. My main research question of how online social interaction may be designed for older people has not been answered by a single experiment or intervention, but by multiple journeys (or programs) conducted in this investigation.

Each journey can be seen as one example or case study of how the main research question could be answered, although for the 4th journey, the extended showroom, a proposition has to be built before it can take place.

In addition, the combined multi-journey journey could be seen as an example for a constructive design research process, which consists of the orientation, explore & discover and reflections phases. In the orientation phase the research team gets to know the target audience, the context and the problem or challenge. In the explore and discover phase, propositions or artefacts are built and assessed by people either in the lab, field or showroom. This phase is likely to have several cycles of research experimentation. Finally, in the reflections phase, the propositions and narratives from the explore and discover phase are collectively reflected upon by stakeholders, who are people relevant to and with interest in the research.

Considering the cyclical process of exemplary design research, the research (sub-) questions were reviewed during the journeys. For some journeys I worked with implicit sub-question, some of which I only fully established in reflection of the experiment and interventions. Overall the sub-questions were addressed during the design journeys partly by the research approach such as design experiments and interventions and partly by gaining knowledge through literature and project reviews, which also formed the basis for a theoretical framework.

For illustration purposes I repeat the diagram by Bang et al., which demonstrates the interconnectedness and recursive nature of CDR in relationship to an implicit or explicit hypothesis, the research questions, evaluation, knowledge and the motivation as a starting point for the research.

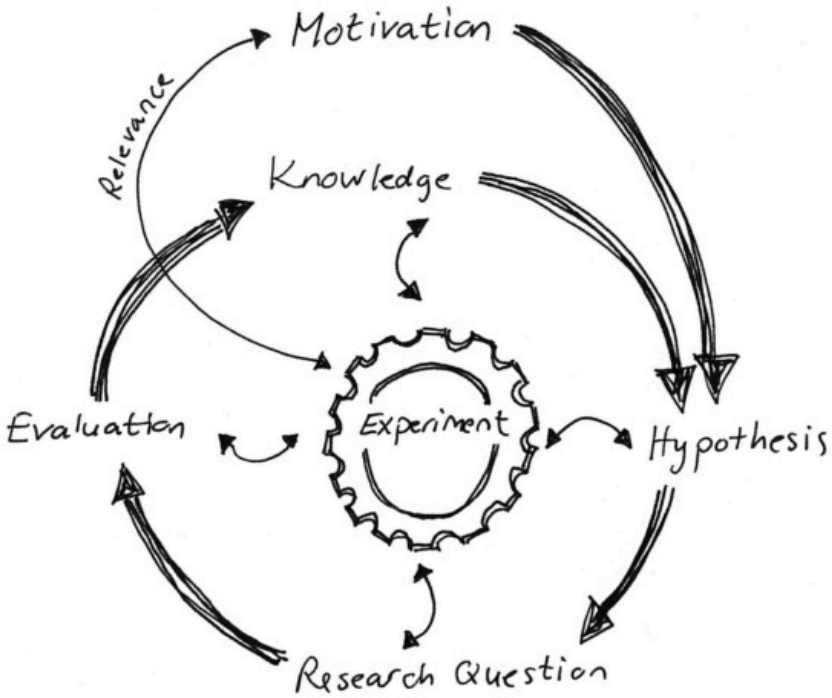


Figure 67: Cyclic model of CDR by Bang et al.

Whilst I fully agree that each design experiment or intervention influences the aspects that Bang et al. describe, I think that this diagram invites further questions. Is the term knowledge not too general? Do Bang et al. mean the researcher's framework or the pool of academic knowledge? In my view, the experiment or intervention needs to include aspects of preparation and evaluation (even if the latter is only in the form of embodiment by the researcher during the experiment i.e. she / he will get an impression of how the intervention had performed). In the larger circle I place the term reflections, which can be interpreted as an evaluation but in my view reflections are more encompassing than evaluation (as described in Chapter 1.2). I make this modification in analogy to Kolb's phases in the cycle of learning, which are active experimentation, concrete experience, reflective observation, abstract conceptualization (Kolb, 1984). In my view it is the total of the constructive design cycle, which adds to the pool of knowledge and makes the research a useful example for other design researchers to learn from.

I have modified the diagram with my suggestions:

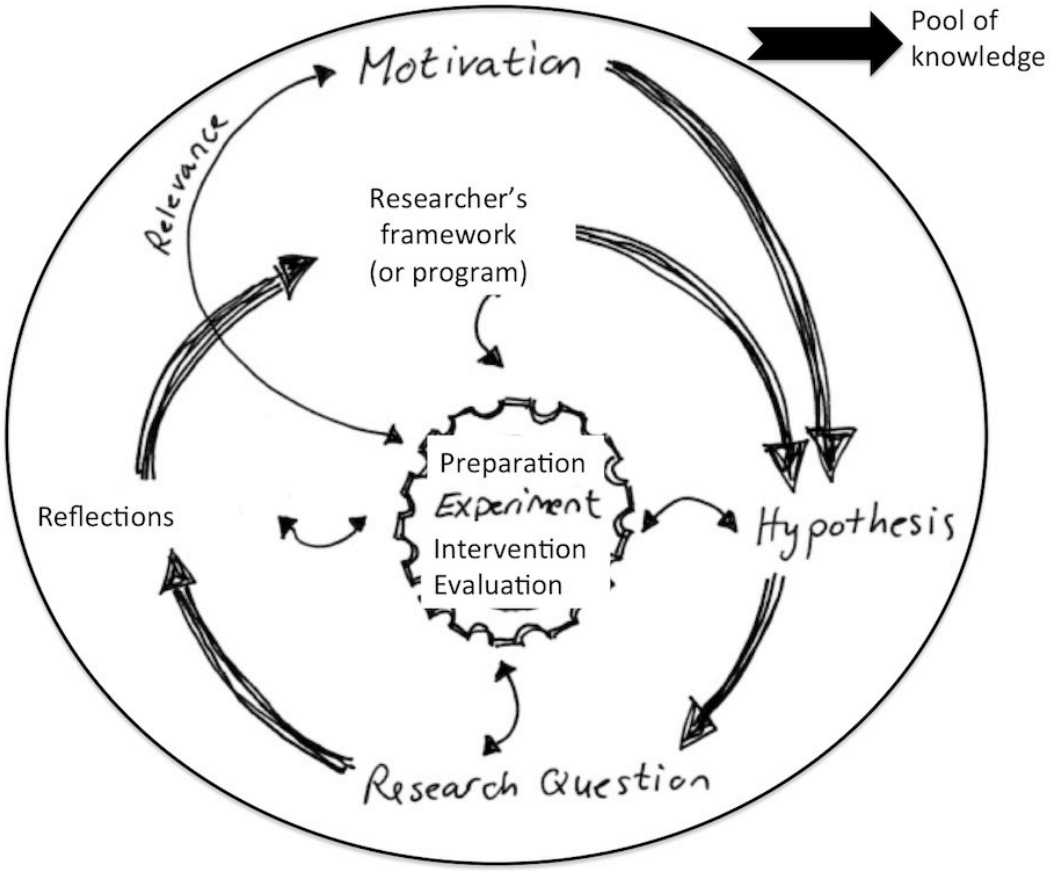


Figure 68: My modified model of Bang et al.'s model for CDR

My version of the diagram points to another issue, which is similar to the issue that action research faces. How many design experiments or interventions are needed in order to come to a 'conclusive' end and to add to the pool of knowledge? In my view this is a tricky question and will never have a straightforward answer since research is a learning journey, topic dependent and the more a person researches, the more one finds out. But it makes sense to report on research and add to the pool of knowledge when research milestones have been reached (such as the award of the doctoral title or the closure of funded research), or when no new discoveries have been made.

Redström and Binder put it in these words (Binder & Redström, 2006, p.15):

> *"Thus, one way of describing what constitutes the end of a 'research cycle' here, is when we reach a stage where it is possible, or even necessary, to basically re- formulate the program as to account for, and generate new, experiments. In practice, we 'see' that we are approaching this point when, for instance, our experiments do not seem to generate as much 'new' knowledge as we would expect them to, and as they appear to be too similar to things we have done before."*

In regards to my research, the number of experimental rounds with the TT and TW were driven by opportunities, time and resources as well as with the view that there was

an evaluation by the public as a “closing round”. This evaluation became later the extended showroom. The minimum number of cycles in my view will always be 2, since the first one is the construction of the artefact and the second is some form of crit, appraisal or evaluation by relevant people.

Similarly to Bang et al.’s model in exemplary design research, re-addressing the research question was also a conclusion for in-the-wild researchers in HCI (Marshall et al., 2011). I also had re-worded my initial main research question after the first design journey. I changed the question from “how do I design for” to “how do I design online social interaction for and with older people.

Returning to my research sub-questions, answers are drawn out of my design journeys, by highlighting and pointing to specific activities and examples.

9.11 Answering the research sub-questions

9.11.1 How do older people currently undertake online social interaction?

This question was mainly addressed through the literature review and with insights from my research activities. For older people, who are online, the most frequent social interaction still happens through email. Although there is a rising trend for more older people to take part in social networking and through other forms of social media (e.g. Skype), the uptake is only slow.

With more Internet savvy older people turning older, there will be more older old people online, but for now people over 75 years + are the least digitally connected age group. More older people are starting to use other devices to connect to the Internet (tablets, iphone) (Ofcom, 2014), which can mean that other forms of online social interaction can become more dominant than email e.g. online chatting or video calling.

9.11.2 What are the design considerations when designing online technology for older people?

Design guidelines alone do not address the issue of technology acceptance and stigmatization. Participatory design, co-design and co-creation approaches help with creating higher technology acceptance and technological inventions that are wished for by people. By involving people in the formulation of the design brief (or themes to address), design research can concentrate on what stakeholders have expressed and where meaning was created together.

The collective approach also helps with bringing out and working against negative attitudes on two levels. It brings out the attitudes by older people themselves towards older people and age (e.g. Colindale club women had sympathy with daycentre visitors) and as well as the pre-conceptions by other people involved in the research (e.g. university students and staff did not know what older people do in a daycentre).

In order to avoid the stigmatization trap the following design principles were developed (see also Chapter 8.9.1):

- Develop a concept that is of use to people of any age
- Keep design and surrounding communication age neutral
- Integrate technology in everyday activities or surroundings (e.g. the TT in TV

analogy, inTouch uses a traditional phone handset (Boyd, 2014))

- Build on people's interests (e.g. watching TV, gardening, classical music)
- Build on intrinsic motivation (playfulness, curiosity, nurturing)
- Crystallize the **main benefit** of the technology and communicate this benefit - with the TT interventions I found out that the main benefit of the TT "connecting as window to another place" was not clear enough (people wanted the TT to have a definite purpose and made suggestions accordingly)
- Hide the computer or move away from the computer (e.g. the photostroller (W. Gaver et al., 2010)) and don't expect computer skills
- Offer instant reward/ feedback (the view in the case of the TT)

When the target audience is definable as vulnerable elderly people in a given context it is key to get to know the target audience in the light of their environment and prevailing culture in order to make the most appropriate design choices. This implies more time needed for the research and collaborative approach within the care home environment.

When conducting a co-design activity the design researchers have to pay critical attention to the composition of the workshop's toolkit, the selection of the relevant participants and the configuration of the event(s) in total.

9.11.3 How may new online social interaction technologies be made suitable for adoption by older people?

Adoption of technology is more likely to be achieved by engaging older people and people with meta-knowledge in the design process. This is likely to be relevant with every target group a designer can design for, but considering the diversity of older people and their everyday contexts this strategy is even more pertinent.

Speaking and observing is important when researching with the group of older users, since users are not always aware of how functionalities were labelled when they carried them out. The designer always needs to construct the preferred state by interpreting the information given by or observed with an older person, since the older person (or anyone) is not necessarily aware of what she / he needs.

The story telling workshop offered some insights into the conditions for adopting new online technology in reality. To summarize these:

- The existence of a support network (proxies users– grandson, neighbours, technical helpline etc.)

- Peers using the services too
- A positive first time experience (or in other words: avoid a negative first time experience)

Bringing the technology to the places where older people are able to try them out requires a safe and accessible environment. Demonstrations of the technology might be necessary before participants would be willing to try it out. Using examples or demonstrations that build on participants' interests are essential to gain buy-in. It is advantageous when the technology can be used in small groups. Creating a shared experience is likely to make participants feel more secure when using new technology.

With in-the-wild interventions there is a danger that ambiguity in information can cause a barrier to trying out the technology. It will be more helpful to inform and invite older participants to engage with the artefact initially.

A greater adoption or interest in new technology can be achieved by gaining opinion leaders' support at the specific location for the new technology.

When designing for vulnerable elderly people it is key to find and collaborate with the "gate keepers", which could be formal or informal carers, volunteers and befrienders. In order to create technology adoption by vulnerable people (which is not safety critical), it is of advantage when the technology addresses intrinsic motivations rather than goal driven aspects set from top-down (e.g. telehealth – fall detection technology).

Co-creation and co-design are suitable approaches to develop ideas for new technologies grounded in the reality of people's experience. Technologies developed out of these activities are likely to create greater buy-in and are therefore more likely to be adopted.

9.11.4 Which elements make a method suitable for researching new technology for and with older people?

Informal, empathetic dialogue-based and in-situ approaches seem to work best, from my experience, when interacting and engaging with older people. This is likely to be because the informal and personal approach takes the worry away about giving the right answer or being judged for one's capabilities or opinions. Conversations and observations, preferably in their surroundings (e.g. contextual enquiries), are key to gain insights into the realities in an older person's life. A questionnaire about online activities can only find out what the person can put in words or find as an option on the questionnaire, but not what they really do (see appendix 3.2ff, especially the ancestry.com anecdote in 3.2.5).

Questionnaires seem to work best as prompt sheets for the investigator and may not be suitable to be filled in by older people where the dimensions of vulnerability were not easily detectable at first sight (e.g. hand tremor). The use of a prompt sheet rather than a questionnaire is similar to questions wheel developed by Dunn et al. (Dunn et al., 2013), which serves as a visual reminder for questions and key areas to be addressed during the interview.

The storytelling workshop format appears to work well as an approach to gain insights into older users' attitudes and motivations for online social media use. The dynamics between participants in the workshops also offer a view into the attitudes by older users towards older people.

Another key ingredient for research with older people is trust. Depending on the research set-up, some researchers have direct access to organizations such as U3A, Age UK, sheltered housing organisations or a specific care home, where they have access to older and elderly people. However, if the researcher has not a network like this in place, then she / he needs to build up trust with potential participants or with the 'gate keepers' (informal / formal carers, organisation management) of potential participants. For this the researcher needs to be consistent, honest, friendly and time rich.

Externalizing and building an idea is a suitable way to get feedback from other people on the researchers' assumptions which she / he placed into the construction. A crit of a construction can take place through an exhibition, a workshop, an in-situ demonstration, in a usability lab or with a natural settings intervention. A natural settings intervention is more likely to produce honest and natural reactions by

participants than lab testing. The choice of assessment is dependent on the intentions of the design researcher. Does she / he want to make people think by provoking them with the designs or by inspiring them? The type of assessment is also dependent on the state of the prototype or construction. If the prototype is prone to issues, it is not advisable to conduct natural settings research.

Taking video of the new technology use has advantages; in so far that it collects tangible and visual data from the research. However, the camera and signing the consent form means that some will be unwilling to take part. Overall, the willingness to try 'new' technology depends on the personality of individuals. The more outgoing and confident a person is, the more likely she / he is willing to try new technology.

When researching with vulnerable elderly people it is of advantage to speak with the person who has meta-knowledge around the vulnerable participants in order to make a judgement on who would enjoy trying new technology out.

A drawback with the empathetic, dialogue-based, informal approach is the issue of setting the relevant boundaries around the researcher- participant relationship. For a researcher new to the topic of older people the experiences gained through interacting with the elderly person can be emotionally unsettling.

It will be easier for active older people to contribute to research by reflecting on something tangible rather than on abstract concepts. Making is a particular useful way when working with the imagining *future technologies*. Mixing the groups with different expert roles can be more conducive to older people's creativity.

Chapter 10

10 Conclusion

This chapter details my research achievements, considers future areas of research and the overall conclusions from this PhD journey.

10.1 Research contributions

My doctoral research developed contributions for 4 major fields of research: design research, participatory design, interaction design and Human computer interaction (HCI).

For design research this PhD research contributes to **design methodology** by establishing CDR further. For this I have modified the diagram by Bang et al. to offer a refreshed model for CDR as a tool for other design researchers to communicate about their research and to make design research comparable at this level. I have specified the type of knowledge and added an outer circle to the process to indicated that the research holistically (with experiment / intervention, framework, hypothesis, research questions and reflections) contribute to the pool of knowledge. I furthered the discussion into the overlaps of places of CDR. In particular for the co-design community the extended showroom is likely to be of interest as a novel approach.

For the HCI, Interaction design, design and participatory community my four design journeys are **documented examples** of designing online social interaction for and with older people. My reflective narrative of the research journey brings out the omnipresent influences of institutional constraints and culture as well as my personal context, which have shaped the design journeys, the artefacts and interventions. The strategies developed during the in-the-wild interventions are likely to be of particular interest to researchers in the interaction and HCI community.

My PhD research collated situated knowledge around older and elderly people's social interaction patterns. This, my considerations and **guidelines for conducting empirical research** with active older and vulnerable older people are likely to be of interest to any researcher who is interested in involving older people in communication and interaction.

Finally, my PhD research produced 2 sets of prototypes, the TT and TW, which are **artefacts** that embody hypotheses, and which were used as tools for researching

online social interaction. These prototypes were springboards for stakeholders to design and discuss future online social interaction that was based on video connectivity. The prototypes and the bespoke TT video app (which I will make available on creative commons) will be of interest to Interaction and design researchers.

10.2 Future areas for research

The concept of vulnerability can affect any person and this requires further exploration. Design research can play a significant role in this, since an empathetic, ethical and sensitive approach to making artefacts can empower unheard voices and lay differences in attitudes and perceptions open. The resulting discussions can potentially facilitate change in attitudes towards vulnerability, stigma and across a spectrum of target groups.

A further agenda emanates from Vines et al.'s claims that the HCI community badly prepares the researcher for working with vulnerable people (J Vines et al., 2014), and that educational materials should have a greater focus on the embodied experience and performance of the co-design researcher. New approaches to researcher training could therefore use techniques such as digital storytelling, immersive experiences and simulations to better prepare those who will undertake this work.

Further research should be carried out on the role of subjectivity and the differences in design researchers' roles (facilitator, interpreter, leader), on how researchers' choices affect research outcomes (see also Light & Akama, 2012). In this respect reporting styles and output formats need to be re-addressed in order to cater for a situated and personal documentation reflecting the researcher's perspective (ibid).

Another aspect to consider for future research is technological progress. With the rise and establishment of ubiquitous computing, wearable technology and advances in connectivity options, new systems, interfaces and interaction mechanisms are likely to emerge. Further explorations into the role and type of technology, which might be most suited for creating a feeling of connectedness and which allow interaction, without demanding computer literacy or other specialized skills, are needed. The extended showroom approach appears to be a suitable way to activate stakeholders' imagination in order to reflect, discuss and collaboratively develop a preferred state for the future.

From participants' feedback on my extended TT showroom (chapter 8), two of the 3 high-level designs, namely 'connected learning' and 'virtual hospital visits' were considered as useful starting points for future systems development. The concept of virtual hospital visits in particular could prove to be an interesting one as there is currently no service or product offering this integrated with the hospital bed [51].

Since my opportunity to introduce the TW in a care home came to a halt at the time, I would be interested in renewing my relationship with KIT, care home management and staff as well as residents in order to research further. My interests would be to explore residents' reactions (and also staffs') to the TW's ludic qualities over a prolonged period of time and where I can make adjustments to the interface iteratively (e.g. infra-red versus button box, adjusting the volume level of the bell or replace it with "on air" lights). Most important with this type of empathetic, collaborative research is to achieve a feeling of enjoyment and fun for the residents, stakeholder and researcher(s) during the activities.

10.3 Conclusions

All four design journeys provided insights into the intricacy and challenges when designing online social technologies for and with older people. Depending on what the design researcher intended to achieve with her / his activities, different approaches are more or less suited.

The first design journey entailed the user-centred approach, which is a useful approach when designing a system or interface that serves a pre-defined design goal. Online social interaction is not a goal, but an activity. If the goal is to reduce social isolation through online social interaction, then the latter can become a means do so. Online connectivity can become a tool to serve the purpose of reducing social isolation. Designing the tool can become an engineering exercise (by measuring the number of contact points and interactions as success criteria), but whether the tool will be accepted is another question (as discussed with the stigmatisation trap Chapter 5.4.3).

[51] However, people's personal mobile phone usually have a camera nowadays and allow for video calling, which means that someone who owns a camera phone can already receive 'virtual hospital' visit on their personal device. In this respect there might be little incentive for the financially stretched NHS to consider integrating video capabilities with their hospital furniture, although it might be particularly useful for the digitally disconnected group, which older people frequently are.

Taking a holistic approach to users, their experiences, values and perceptions is likely to provide suitable and adopted products / services by the population rather than products / services developed simply from guidelines.

The second design journey involves constructive design research by making the TT and setting up interventions with it. Based on my theoretical framework, I conducted my research using the TT for a technology probe in real world settings. I placed the TT into the wild connecting older and younger people. This experimental approach was useful for the exploration of the TT concept - i.e. the use of online video as connectivity tool - and learning about older people. This flexible 'design for participatory reflection' approach will be invaluable for many other exploratory design research projects engaging older people in sensitive design holistically.

I have applied my modified diagram for CDR on the TT research journey to give other design researchers an example on how to apply the model.

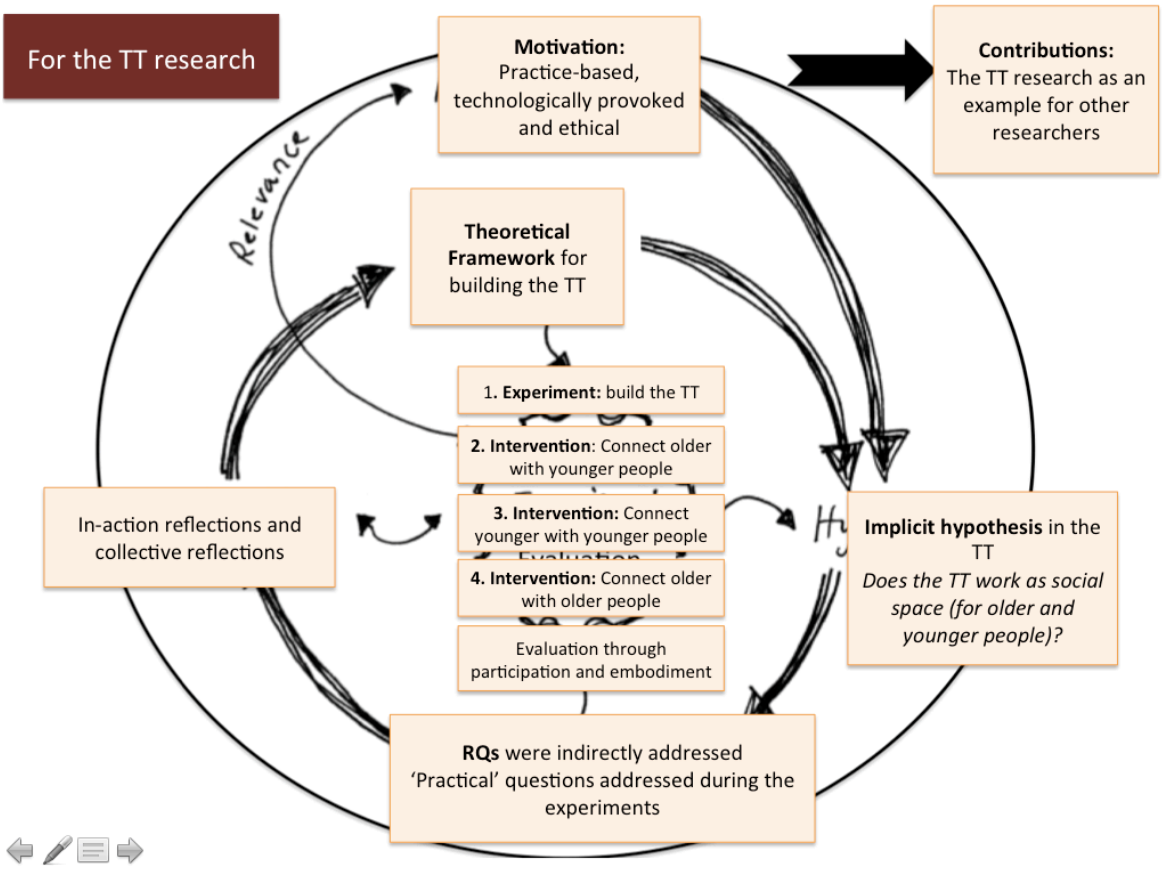


Figure 69: Modified diagram for CDR applied for the TT research

The diagram illustrates how my motivations led me to building the TT based on an implicit hypothesis, my theoretical framework and research questions. While I conducted the interventions, I reflected-in-action and afterwards on actions. Participants and research helpers taking part during the interventions also reflected

on the TT's design and overall concept. Lessons were learnt and iterations applied during the cycles of research interventions.

The third design journey, which was one of those 'real world' opportunities, was a product design exercise. A positive aspect of this particular product, the TW, was that it was based on ludic engagement, which made it joyful and fun rather than a must use (rather than products with an instrumental focus e.g. Telecare).

In this design journey I worked collaboratively with KIT volunteers and care home management, which was very useful. This experience also demonstrated a number of difficulties that must be considered when undertaking this type of work.

The experience emphasised the value of getting to know the individual residents (octogenarian, nonagenarians, centenarians). This personal and immersive approach to getting to know the residents took my understanding of the situation to a different level, which I could have not achieved by learning through mediated sources. This immersive collaborative design approach will be relevant for any life enhancing product (or service) design opportunity for residents in a care home.

In order to demonstrate another use of the modified diagram I also applied it for the 3rd design journey.

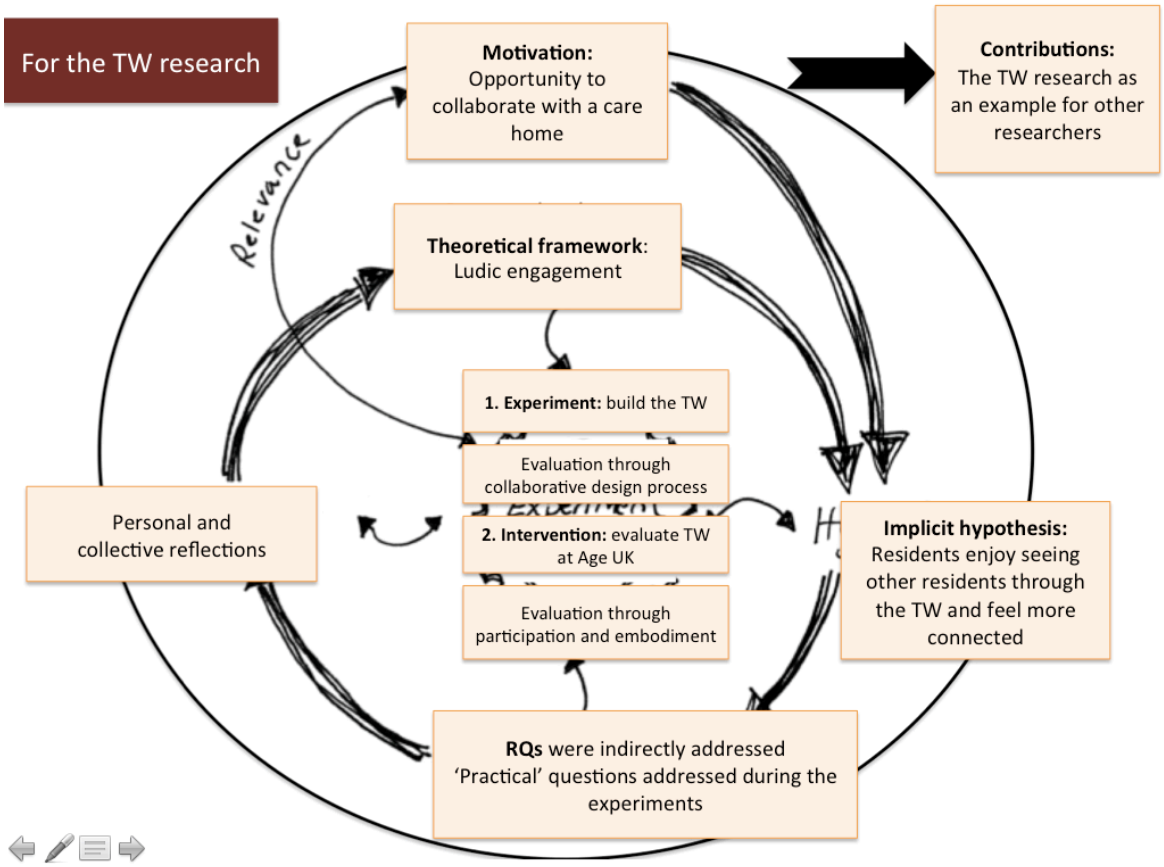


Figure 70: Modified diagram applied to TW research

Without going into the descriptive detail the updated CDR diagram also works for the TW research journey.

The fourth design journey was the most enjoyable approach from my side, and for the participants according to the feedback sheets. But organising an event like this also has its drawbacks. The researcher has to find a balance between proactively steering and simply facilitating the workshop. The discussions and questions asked during the event form all part of the collective sense making. Participants engaged with design considerations for online video connectivity for their own future lived experience (see design exercises in Chapter 8.6.2 and 8.6.3). The constructive co-design approach is a dialogue between researcher and stakeholders (in the widest sense). It is a useful approach for incremental innovation by creating future technology ideas based on a group consensus and to empower participants by mutual learning.

To demonstrate the flexibility of CDR I also applied the updated diagram to the 4th design journey.

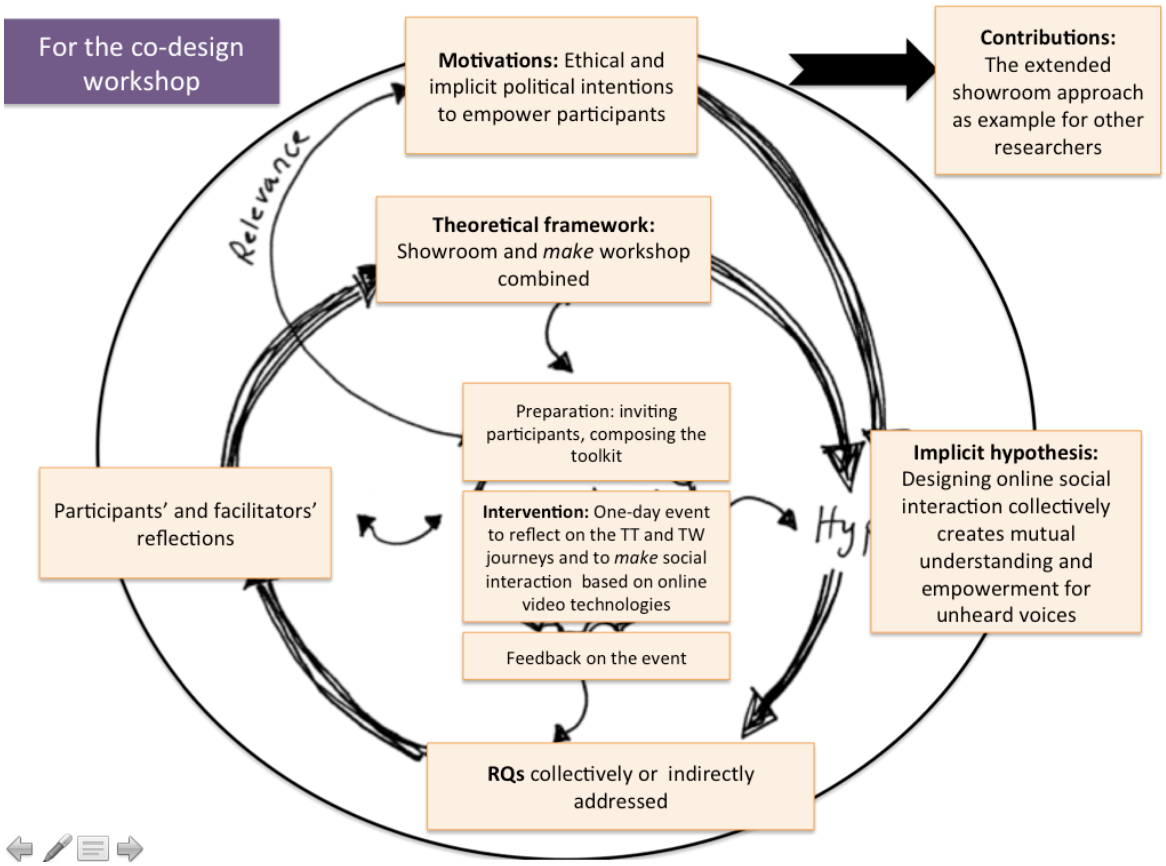


Figure 71: Modified CDR diagram applied on 4th design journey.

Overall, taking the shifts in my PhD research journey into account I come to the conclusion that a *designing with* approach with a definable group is most beneficial

when it concerns social interaction and future online technology. This is because social interaction is already a complex and multi-dimensional activity for people of any age group. Staying focussed on a definable group (e.g. care home residents) helps to frame the design challenge for developing future interaction technologies. During a ‘with approach’ attitudes and possible misconceptions will be laid open, which allows space for mutual learning and understanding.

Considering the diversity of older people an emphatic, collaborative and empowering approach is useful in order to develop preferred states of online technology use that are meaningful to the older people and to the society in general.

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